Light and LIGHTING

NOVEMBER, 1959 PRICE 2s. 6d

New
Light on industry
with the superb ranges of
BENJAMIN
TASKMASTER and MODEL FIFTY Fittings
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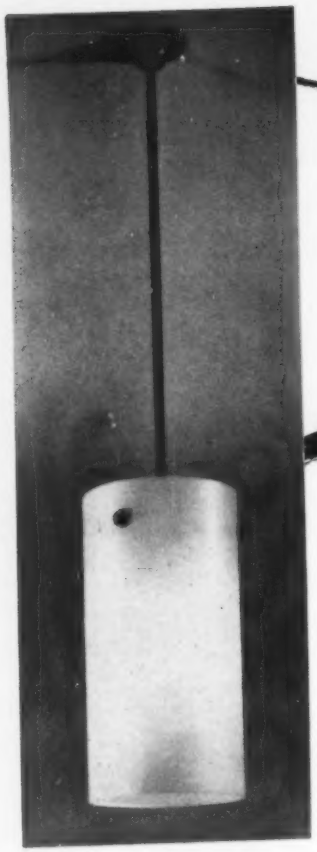

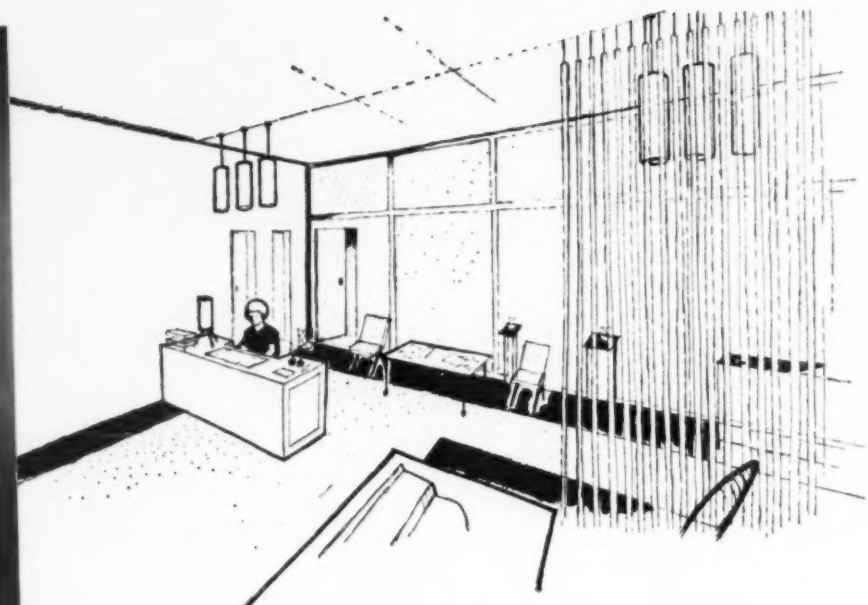

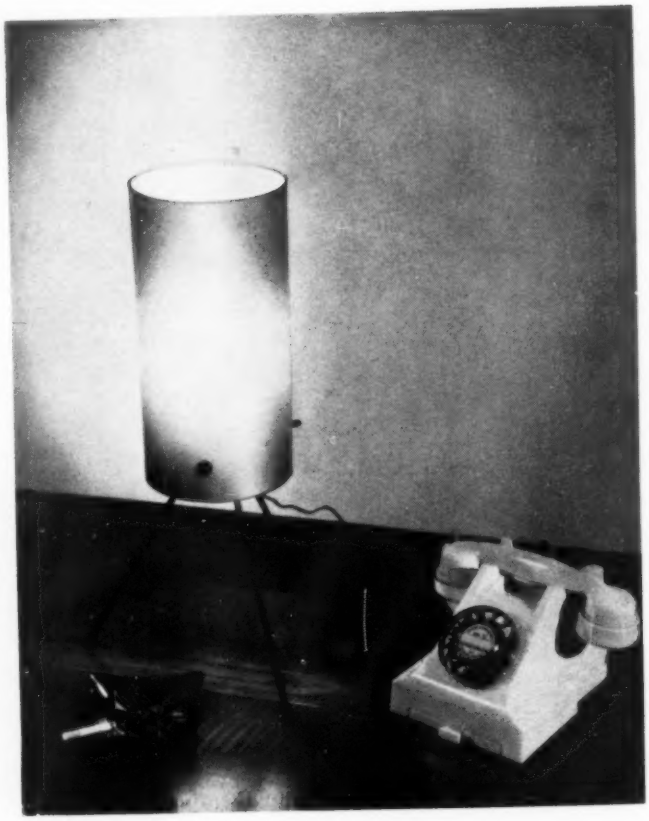

This new Cylinder pendant fitting and Table Lamp has now been added to the Hailwood range, and is suitable for both domestic and commercial use. The glassware can be supplied in 3 ply opal, satin opal or green and white.

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100 LUMENS PER WATT

FIRST IN THE WORLD

Mazda

200w 3ft. LINEAR SODIUM LAMP

This new Mazda Sodium Lamp, designed from first principles by A.E.I. Lamp & Lighting Co. Ltd., is the first practical lamp in the world to achieve an efficiency of 100 lumens per watt. It is a single line source. The increase in efficiency, about 25% up on previous sodium lamps, is obtained from the design of ingenious grooved arc tube in which the metallic sodium is retained. The tube is mounted in a 1½" diameter 36" outer tube with bi-pin caps to form a robust and easily handled lamp with a life of approximately 4000 hours. The Mazda 200w linear sodium lamp in the Amberline lantern, specially designed for this new light source, is the economic answer to the problem of providing higher lighting intensities on main traffic routes.

AEI Lamp and Lighting Co Ltd

AMBERLINE

Introduces new possibilities in street lighting

A.E.I. LAMP & LIGHTING COMPANY LIMITED, MELTON ROAD, LEICESTER 4828

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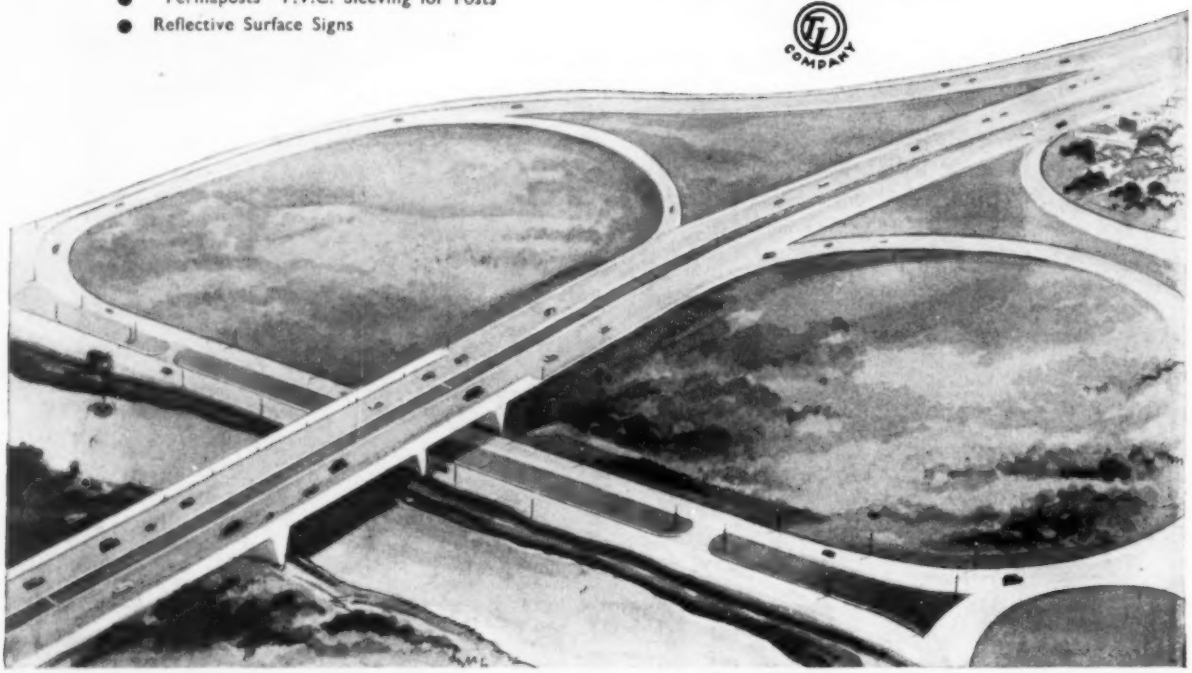

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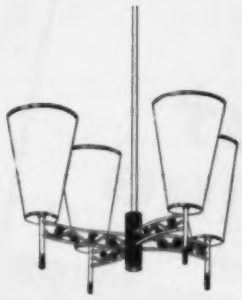

to grace elegant homes – leaf fittings

Leaf's Luxury Look . . . . .
Slimly elegant satin brass and sculptural green leaf motifs. A suite of six designs—pendants, ceiling fittings and wall brackets. Leaf fittings add grace and beauty to any home, whether modern or traditional.
Colour leaflet gladly sent on request.

G.E.C.
LIGHTING DIVISION

THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

Introducing an entirely

NEW MINIATURE FLUORESCENT LIGHTING FITTING

COMPLETE WITH TWO 12-inch, 8-watt LAMPS

Wherever a 25/40/60 watt tungsten filament lamp is now used here is a vastly superior fitting for all such applications

Consider these new and unique design features

1. Designed to comply with B.S.2467:1954 and latest amendments which covers Minimum Safety Requirements for Lighting Fittings for use with Hot Cathode Tubular Fluorescent Lamps.
2. Fully tested before and after fitting lamps.
3. Weatherproof and Dustproof.
4. Corrosion-resistant.
5. Non-corrodible thief-proof hinging at one end and non-ferrous key-operated fastening screw.
6. Perspex cover, chosen for its light transmission and diffusing properties, has been most carefully supported mechanically. Its clean lines and absence of supporting metalwork ensure maximum light output and distribution.
7. Uses the latest type polyester-filled choke.
8. Fully power factor corrected.
9. Separate circuit for each lamp ensuring maximum availability.
10. Shrouded lampholders to accommodate lamps to American, European or British standards of tube diameter.
11. Lamp life 12 months or more when operated continuously.
12. Designed and engineered for absolutely minimum maintenance.

Lampholder (Patent applied for). Design of Fitting (Registration applied for)

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FOR ELECTRIC DISCHARGE LAMPS

The steadily increasing preference for PARMAR Chokes and Transformers in Public Lighting schemes is an acknowledgement of efficient performance in all conditions. PARMAR Auxiliary Control Gear has justifiably earned this high reputation for complete reliability in service . . . simply because our spacious factory at Draycott is planned for specialisation in the manufacture of Chokes and Transformers . . . and our immense production capacity is made possible by many years of experience and top level 'know how' geared to suit our customers' requirements.

Slim line Control Gear for Sodium lamps in diecast case.

* *Satin Black Finish or Anodised Finish in Blue or Orange for Safety and Identification*

80w. Q.S. Unit (drawn case).

The PARMAR factory is one of the largest in the United Kingdom producing every Control Gear for all types of sodium, high pressure mercury vapour, fluorescent, and other discharge lamps. Public Lighting Engineers, in addition to the assurance of prompt deliveries according to schedule, are offered the extensive facilities of the PARMAR Technical Service whenever particular problems may arise in specification planning. Our comprehensive catologue, which includes a complete price list, will be forwarded on request.

Choose

PARMAR

for reliability and performance

Sodium and H.P.M.V. Control Gear. Diecast case.

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Quality at the Dog Show, Prize Poodle *(Photo Thomas Fall)*

CRYSELCO

lamps and fittings can be obtained from any of fourteen branches and depots throughout the country.

All CRYSELCO business is based upon a policy of Quality and Service.

This attention to detail in production and distribution, coupled with more than 60 years' experience in lamp manufacture, ensures quality products, promptly delivered.

The range of lamps and fittings available is extensive. If you have not received the current catalogue, please send for one today.

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are situated throughout the country.

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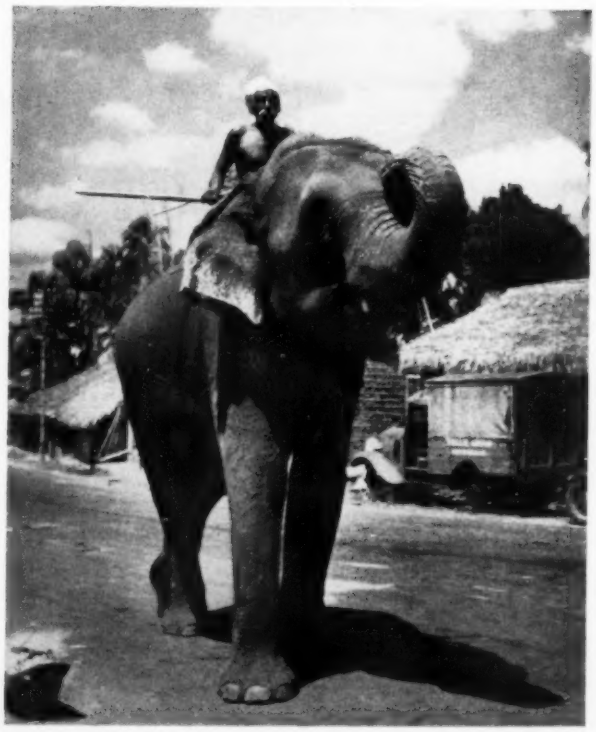
CRYSELCO LIMITED

KEMPSTON WORKS **BEDFORD**



Service by Elephant, Ceylon *(Photo J. Allan Cash)*

STANTON

Prestressed Spun Concrete Lighting Columns

Stanton Type 8K/1 Spun Concrete Lighting Columns fitted with G.E.C. z.8484 Fluorescent Lanterns at Bedford.

Photograph by courtesy of F. W. Dawkes, Esq., B.Sc. (Eng.), A.M.I.C.E., M.I. Mun. E., A.M.T.P.I., Borough Engineer & Surveyor.

The type shown is one of many Stanton designs approved by the Council of Industrial Design and acceptable to the Ministry of Transport for use on trunk roads.

THE STANTON IRONWORKS COMPANY LIMITED NEAR NOTTINGHAM

SANGAMO

Time Switches for street lighting control

SOLAR DIAL SWITCH

Long-term reliability

In every sphere experience has shown that there is a place for the product which is "just a little better" both in design and in construction.
In Time Switches that place is filled by the SANGAMO range—manufactured with finest engineering precision not only to function accurately NOW but to go on giving faithful service almost indefinitely.
Advice and particulars of the entire range of Sangamo synchronous Time Switches will gladly be supplied on application.

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POLYPHASE WATTHOUR
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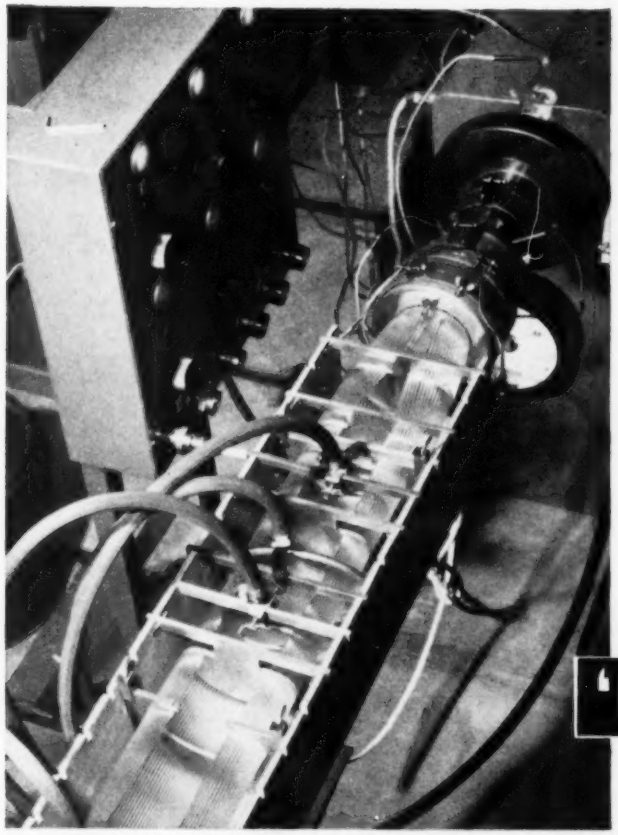
SW/75

NOW — ANOTHER IMPORTANT
I.C.I. 'FIRST' FOR THE LIGHTING INDUSTRY

Diffusers for lighting fittings extruded from 'Diakon' acrylic polymer M.G. by advanced techniques



Extrusion of 'Diakon' polymer to produce a reeded diffuser for a fluorescent lighting fitting. View of extruded section passing from die-head through cooling system.

FOR the first time diffusers for lighting fittings can be extruded from 'Diakon' acrylic polymer M.G. This follows the development of advanced extrusion techniques by the Technical Service and Development Department of I.C.I. Plastics Division. Polymer extrusion coupled with post-forming enables acrylic diffusers of many contours to be produced from a single die more cheaply and efficiently than before.

This is another outstanding I.C.I. Plastics Division achievement for the lighting industry to add to the earlier ones such as:—

Translucent 'Perspex' acrylic reflectors
'Perspex' acrylic refractor plates
'Diakon' injection moulded refractors
'Darvic' rigid p.v.c. sheet non-corrodible reflectors

'DIAKON'

'Diakon', 'Perspex' and 'Darvic' are registered trade marks for products manufactured by I.C.I.

DK 3

IMPERIAL CHEMICAL INDUSTRIES LIMITED, LONDON, S.W.1

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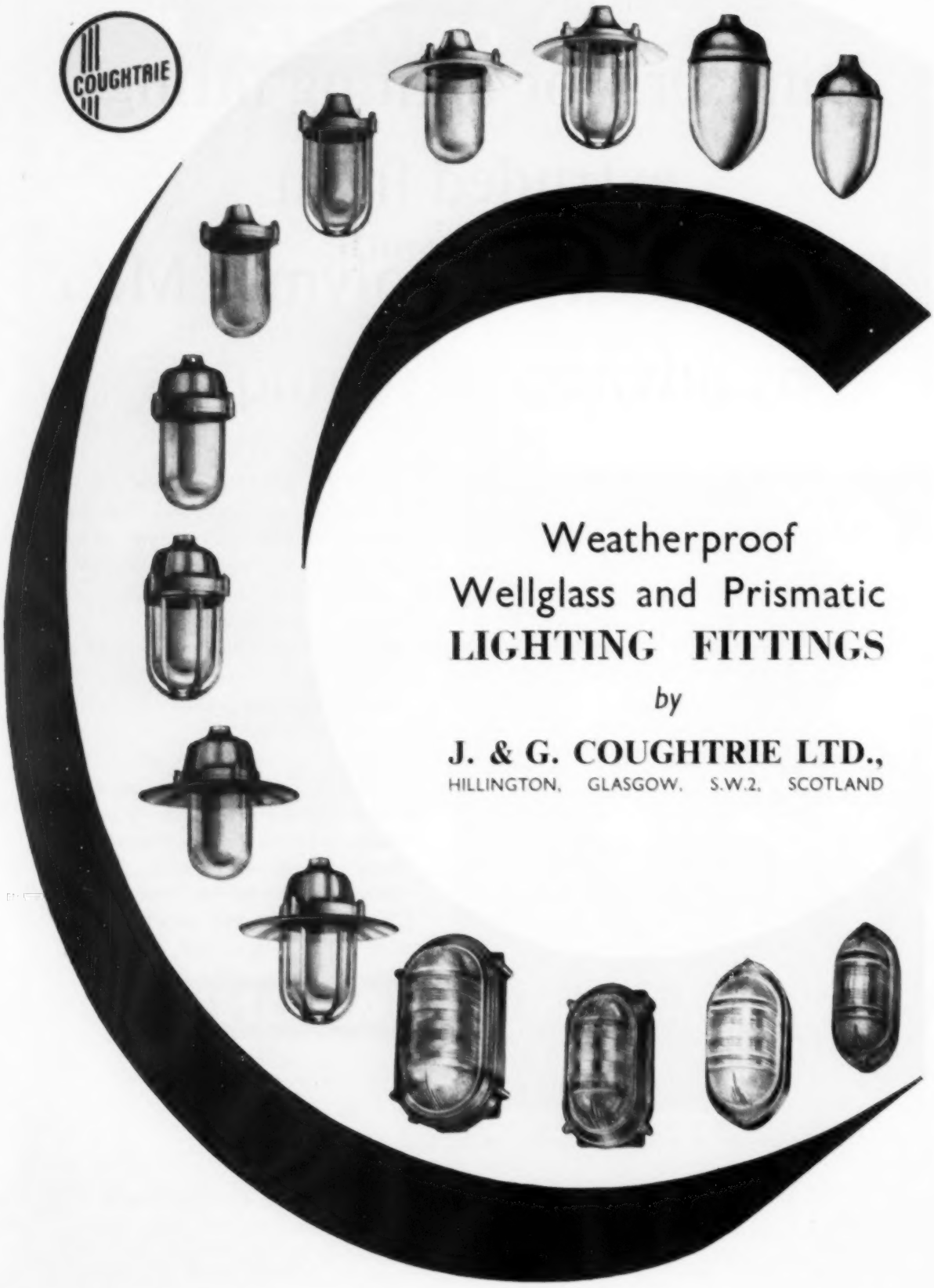
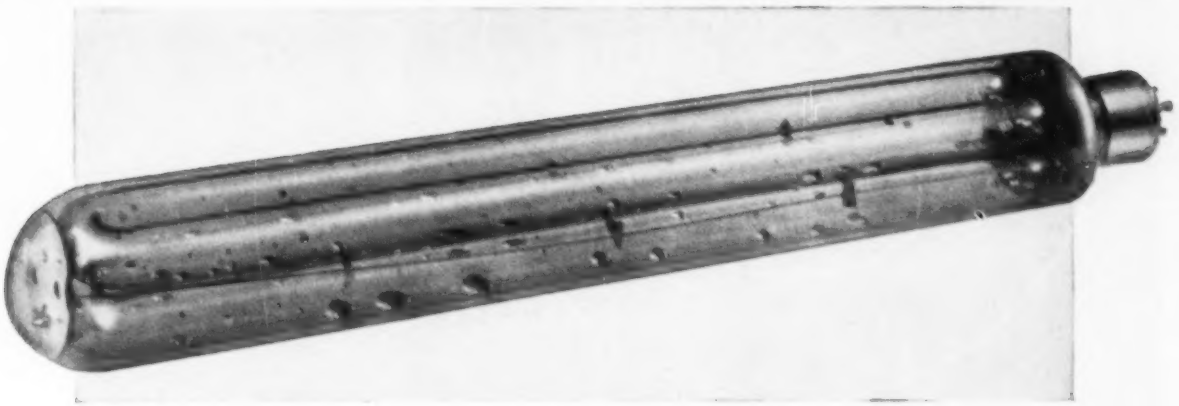


Weatherproof
Wellglass and Prismatic
LIGHTING FITTINGS
by
J. & G. COUGHTRIE LTD.,
HILLINGTON, GLASGOW, S.W.2, SCOTLAND

Dependability...

where it matters—

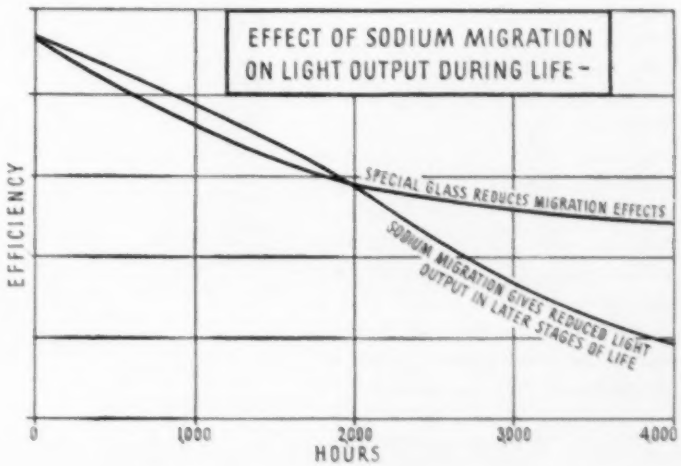
Osram Integral Sodium Lamps



From major highways to minor roads, the Osram Integral Sodium Lamp is proving itself an outstanding feature of modern lighting installations. The key to its performance is in its all-round dependability. The following features deserve your attention.

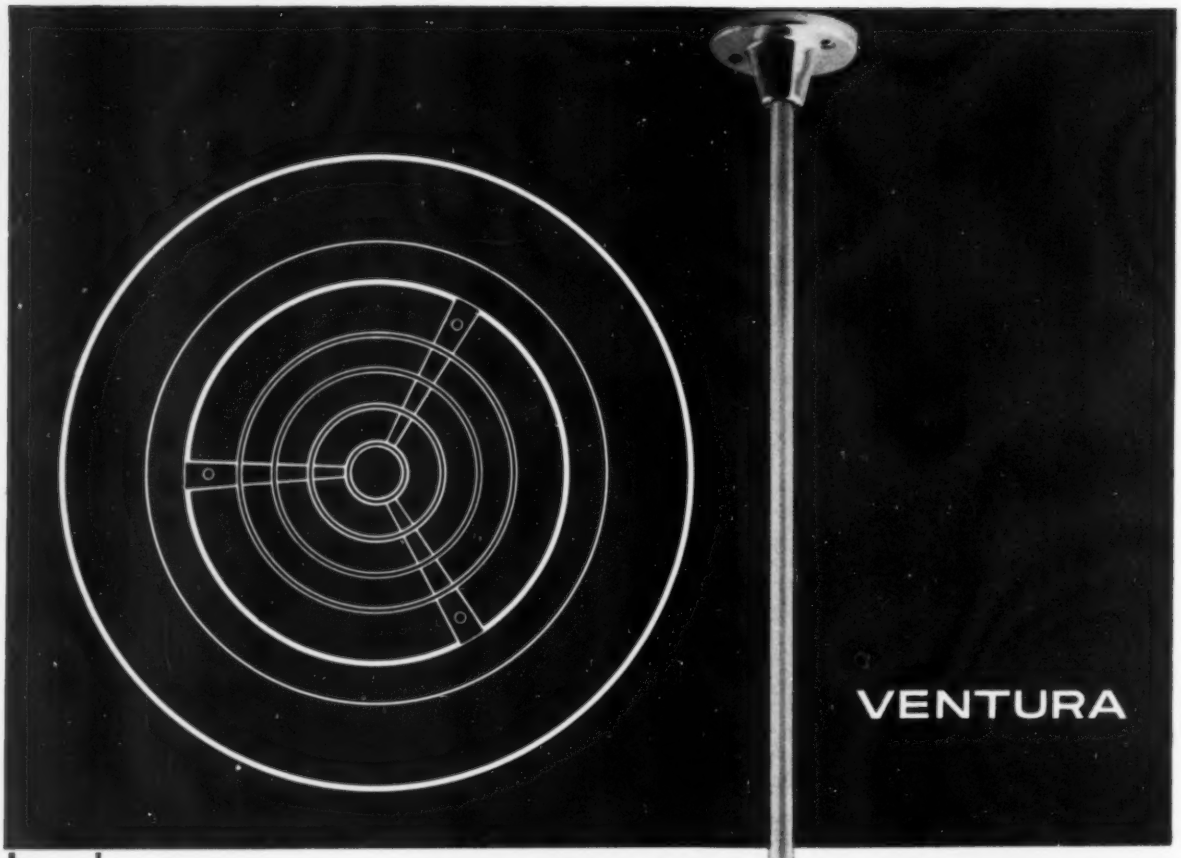
* **Consistent starting**
  The integral jacket protects the tube in all atmospheric conditions.
* **Maximum light**
  Special sodium resistant glass minimises sodium migration—maintains uniform brightness along the length of the tube.
* **Safeguarded Control Gear**
  Built-in safety fuses protect the control gear should rectification develop at the end of life.
* **Simple Replacement**
  One piece Osram integral sodium lamps make replacements simple and are directly interchangeable with detachable jacket lamps.

Skilled advice on all aspects of modern street lighting is available from your nearest G.E.C. branch.



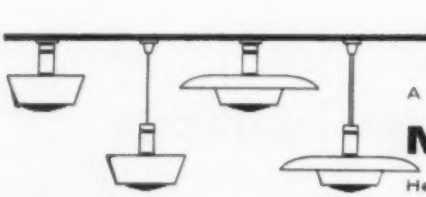
Osram adds life to your lighting!

The General Electric Co. Ltd. Magnet House, Kingsway, London W.C.2



logic

The Ventura series by Merchant Adventurers Limited provides architects and engineers with a range of twenty lighting fittings designed with logical simplicity to fulfil a variety of common lighting needs. They give general lighting with a high degree of diffusion and with no disturbing glare. Moulded in white opal translucent plastic, the diffuser has an open top for shadowless ceiling lighting. The open louvred aperture gives virtually uninterrupted downward lighting while shielding the bare lamp from all normal viewpoints. Prices from 19/2d. including P.T.



MA

A comprehensive leaflet giving full data and prices is available on request.

Merchant Adventurers Limited

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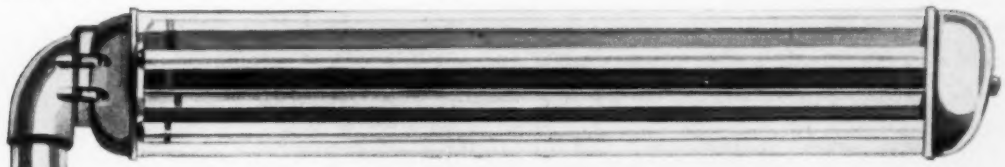
London Showrooms: 43, Portland Road, London, W.11. PARk 1221



Specialization, Speed, Economy, Dependability

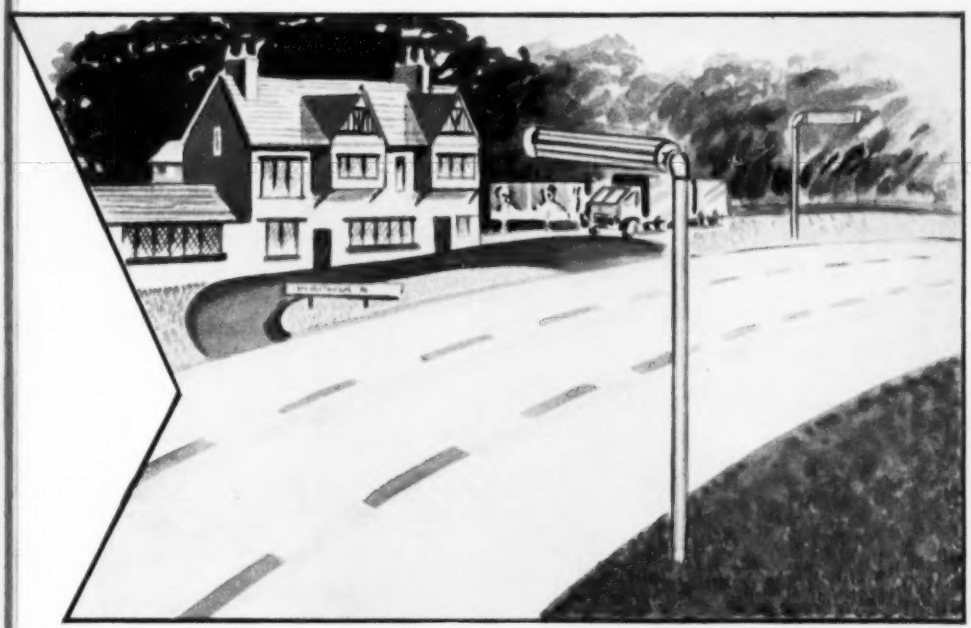
You need fittings made from quality plastics . . .

You want them accurately shaped, correct in size, pleasing in design . . .

You must have them delivered to the right place at the right time . . .

You rightly expect the cost to be keenly competitive . . .

You should certainly get in touch right away with Wokingham Plastics Ltd.



We offer an all-embracing service that includes every need for Street or Large Areas Exterior Lighting.

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solves lighting problems cheaply without replacement worries

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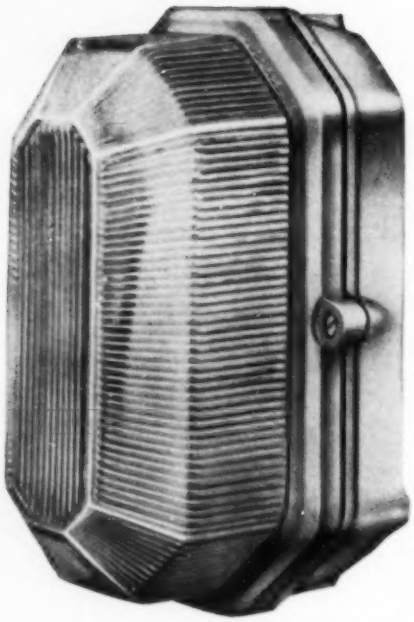

Weatherproof — High quality prismatic glass
Detachable front cover — Aluminium finished cast iron body
Choice of 5 inlets — Skirted porcelain B.C. lampholder

Takes up to 100 w. lamps

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W39160

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New ranges of capacitors (Types L89/4 and L89/5) employing specially processed impregnants are now available. They are based on Hunts popular designs for fluorescent lighting applications. Full details freely available on request.

TYPE L89/5 STANDARD RANGE *(8 μF to 20 μF at 250 v A.C. wkg.)* *Temperature Range:* −40°C to +70°C, ideal for Street Lighting applications in all climatic conditions.

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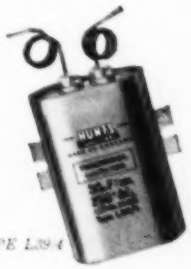
TYPE L89/5



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MAKERS OF FIXED CAPACITORS FOR ALL RADIO, ELECTRONIC AND ELECTRICAL POWER USES, DRY ELECTROLYTIC, METALLISED PAPER, FOIL AND PAPER, SILVERED MICA, STACKED MICA, CERAMIC, TRANSMITTING TYPES, ETC.

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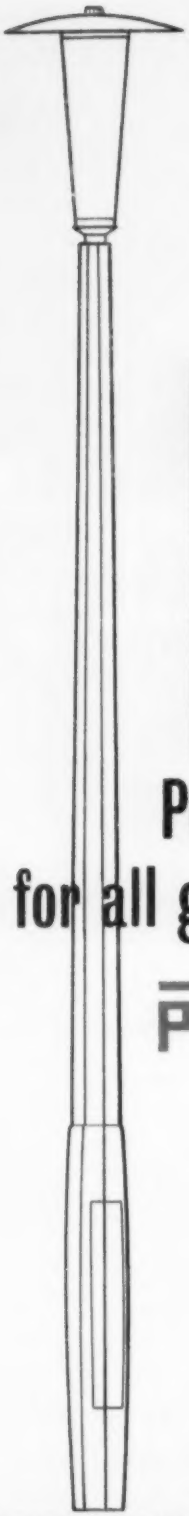

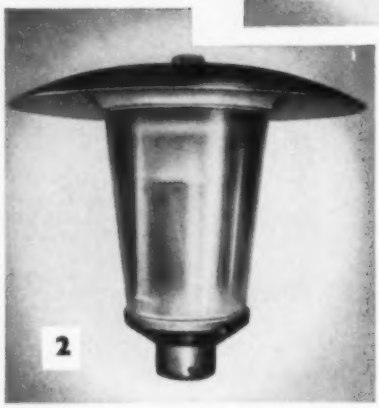

Post-top lanterns
for all group B lighting

PHOSWARE

1. The P. 108. A.
2. The P. 107. A.
3. The P. 142 Fluorescent.
4. The P. 140 Fluorescent.
5. The P. 110 "Paddington."

PHOSCO LIMITED · HOE LANE · WARE · HERTFORDSHIRE

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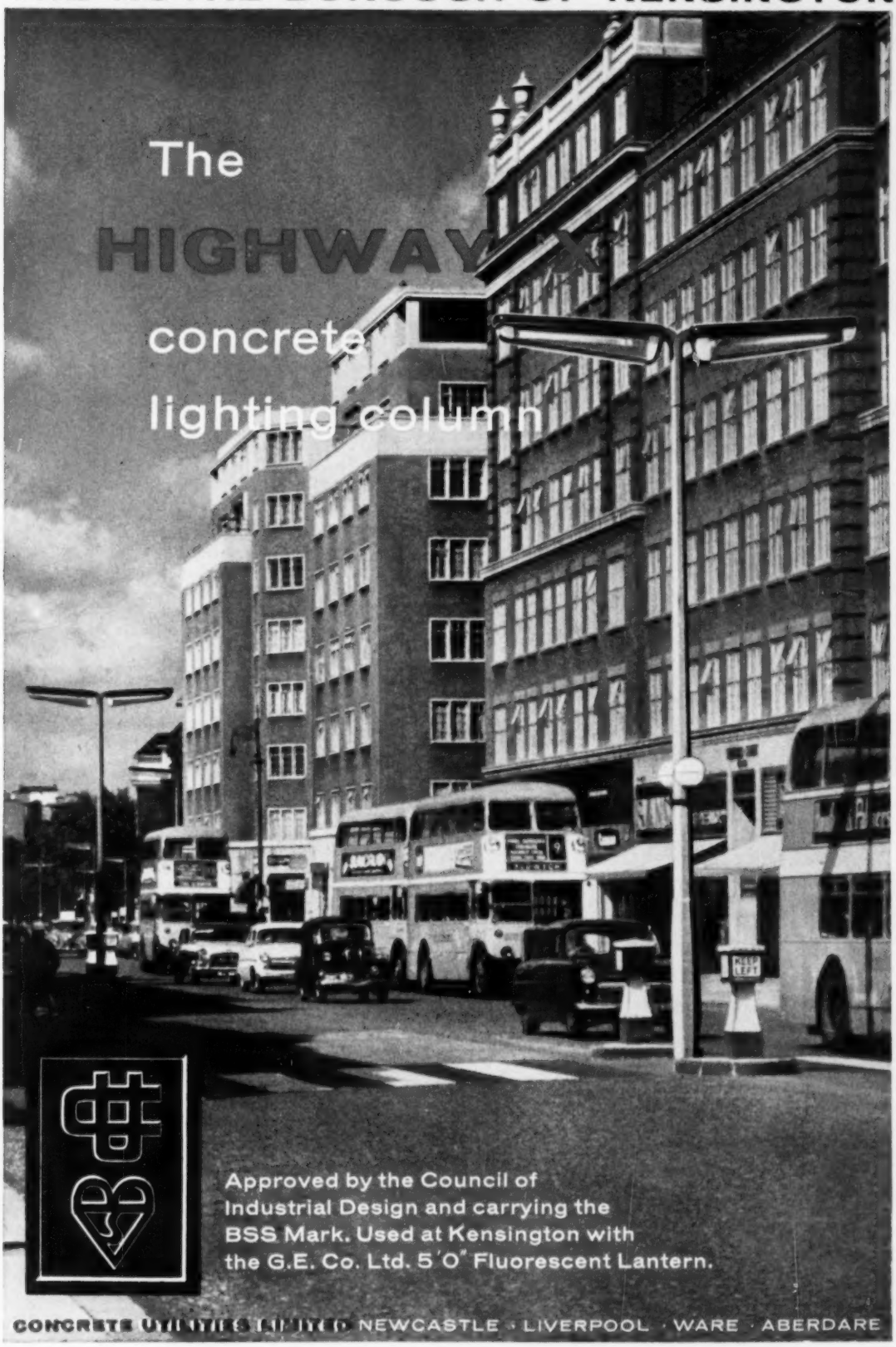
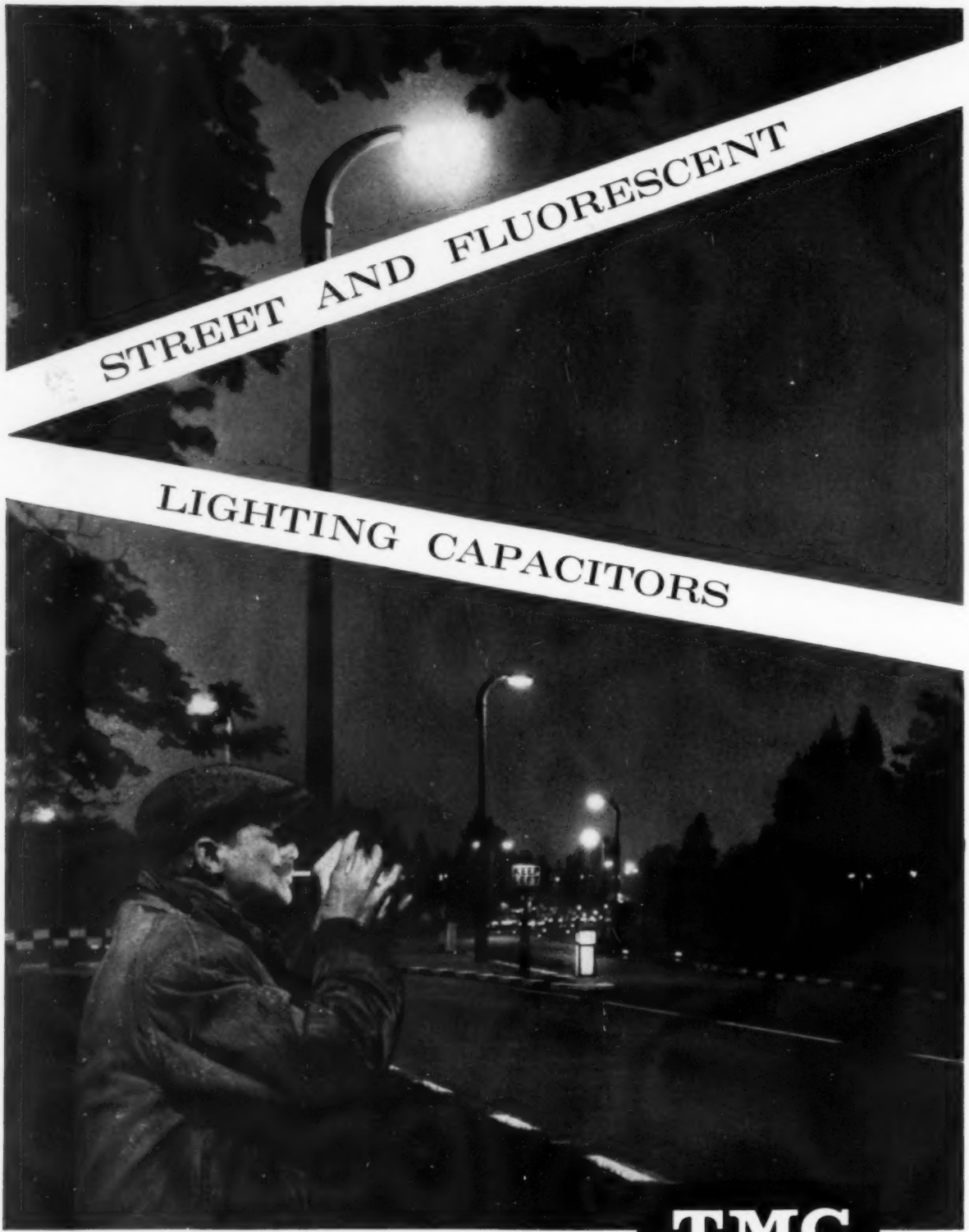

The
HIGHWAY
concrete
lighting column
Approved by the Council of
Industrial Design and carrying the
BSS Mark. Used at Kensington with
the G.E. Co. Ltd. 5'0" Fluorescent Lantern.
CONCRETE UTILITIES LIMITED NEWCASTLE · LIVERPOOL · WARE · ABERDARE



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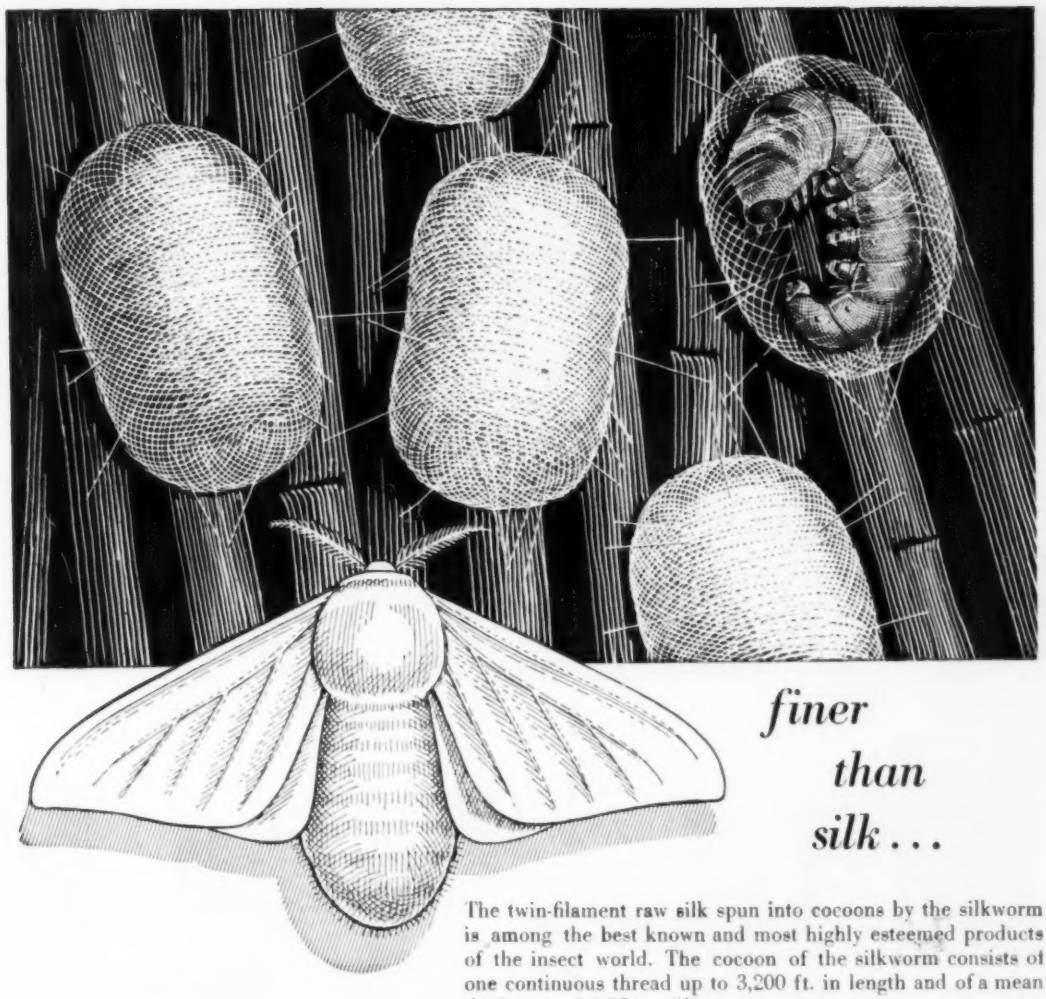

finer than silk . . .

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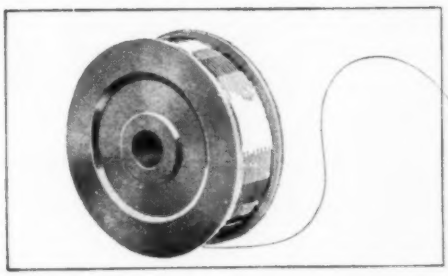
The Luma Works, the largest Scandinavian producers of incandescent and fluorescent lamps, use tungsten and molybdenum wire-drawing machines which are the "silkworms" of modern engineering.

Fine as is natural silk, Luma wire is even finer. The smallest dimension of tungsten wire is 0.118 mil, and every pound of tungsten goes to make 2035 miles of wire!

Luma exports 90 per cent of its tungsten and molybdenum wire, and Luma wire is used in radio valves and bulbs in more than 50 countries.

You, too, can get Luma wire in all dimensions and finishes, e. g. black, cleaned or plated, semi-finished rods or finished electrodes.

Write immediately for our new tungsten catalogue in English, French or German.



We manufacture all types of incandescent, mercury vapour, neon and fluorescent lamps, fluorescent fittings and accessories.

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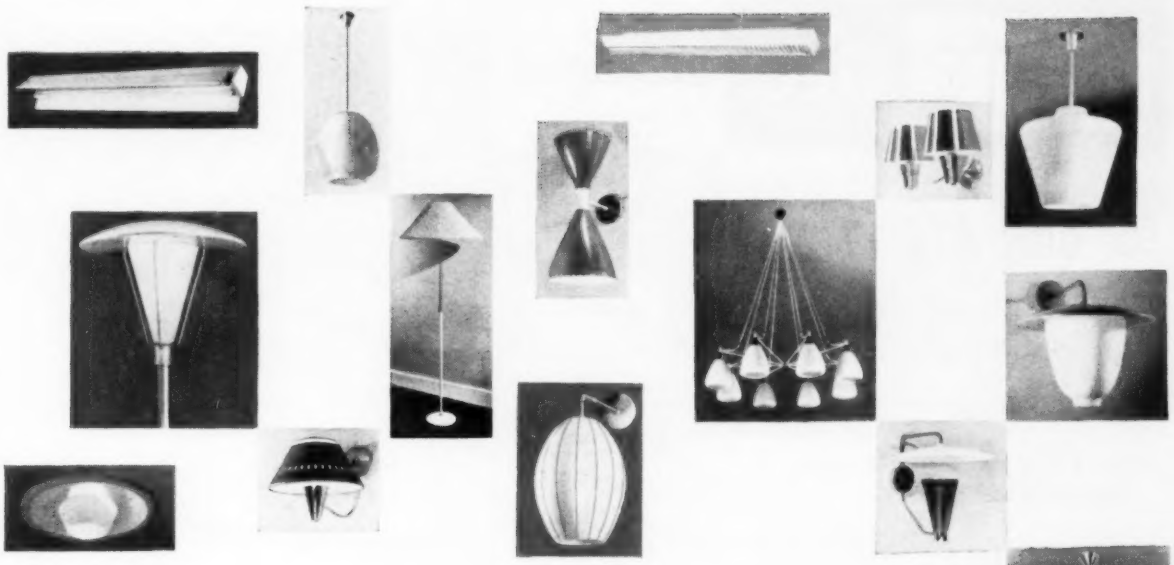

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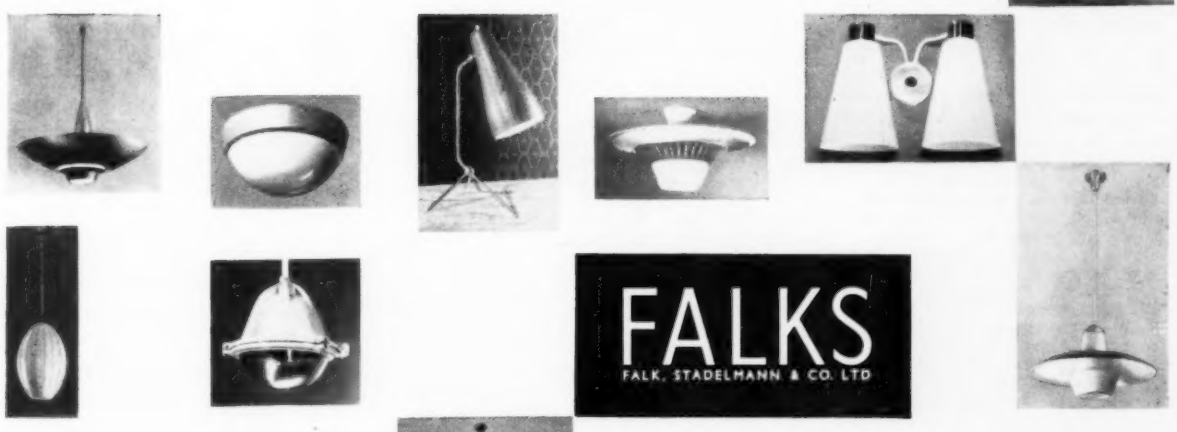

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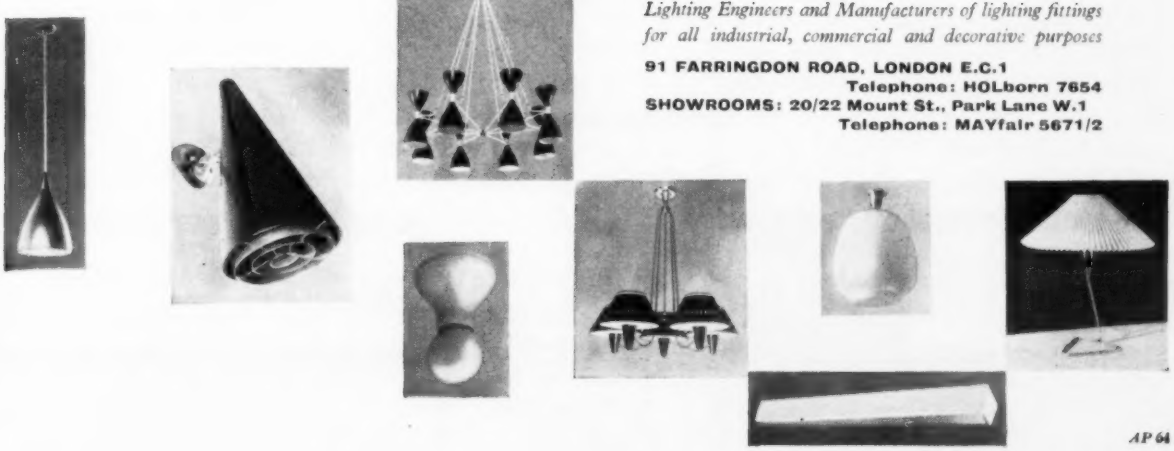

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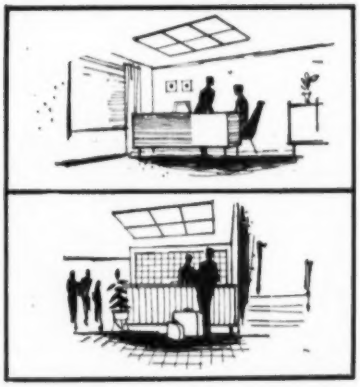

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Lighting and Road Safety

The annual number of suicides in this country is now nearly equal to the annual number of "accidental" deaths on our roads. Some of the fatalities on the roads are virtually suicides since they are due to the deceased persons' wilful or stupid disregard of known risks. Others are killings in which the victims have been unable to escape the consequences of another's folly. How many are true accidents—that is, fatalities due to fortuitous and unforeseeable circumstances—is unknown. So, too, is the number of fatalities, and of lesser personal injury "accidents", of which lighting has been at least a contributory cause. What is known is that good street lighting does reduce the night road accident rate, and that many of our streets have yet to be provided with lighting of this kind. Nevertheless, there have been numerous visible improvements in the lighting of streets in various localities even during the past year, and so we may feel assured that some new contribution has been made towards the safety of road users. Of course, the better the lighting is made on some roads the worse—by comparison—it becomes on adjacent stretches which are not re-lighted to the same standard. Road users should realise that this is inevitable and that special care is necessary in transitional areas.

Notes and News

The IES Gold Medal

THE Illuminating Engineering Society announced some months ago that it was instituting a Gold Medal to commemorate its Golden Jubilee, the medal to be awarded at intervals of not less than two years to individuals, whether members of the Society or not, who have made outstanding contributions to the advancement of lighting.

It is with very great pleasure we report that the first award of the IES Gold Medal has been made to Dr. J. W. T. Walsh, OBE, who received the medal from the hands of the retiring President, Mr. C. C. Smith, at the opening meeting of the new IES session on October 13.

The medal may be awarded to persons of any nationality and the IES, therefore, has the whole world from which to choose. We can think of no one more highly regarded in the world of lighting today than Dr. Walsh. He and his work are known internationally and he was until recently President of the International Commission on Illumination having served that organisation actively for nearly 40 years in various capacities. In this respect alone his contribution to lighting has been outstanding. One might say that the whole of his working life has been in the service of lighting, a service which he has continued since he retired in 1951 after 38 years at the National Physical Laboratory. One of his earliest contributions to lighting was a large scale photometric survey of factory lighting which he conducted in 1913 for the Home Office, a survey which was the first step towards statutory regulations for lighting in factories. As an author Dr. Walsh has made invaluable contributions to the literature both by way of technical papers and books; indeed, students of lighting owe him much, his book on photometry, which was first published in 1926, and in revised form in 1953, being the standard work on the subject. His "Textbook of Illuminating Engineering" was written at the request of the IES and many students have made good use of it.

Dr. J. W. T. Walsh, receiving the IES Gold Medal from Mr. C. C. Smith.

Dr. Walsh joined the IES in 1914 and his many services to the Society since then have been recognised by two terms of office as President, in 1923 and in 1947, and by election as an Honorary Member a few years ago. This award of the first Gold Medal is in recognition of something much wider; as inscribed on the reverse of the medal it is "For outstanding contributions to the advancement of lighting."

On receiving the medal Dr. Walsh said: From the moment I had the first indication of this a few days ago I have been trying hard to think of something that I could say that would adequately express my appreciation of this great honour which the Society has done me. I feel that I cannot express my feelings in the matter. I have been a member of the Society a good many years and I owe it a tremendous debt of gratitude, not only for the honours which it has conferred upon me in its kindness, but for a number of other things; for all that I have learnt from my fellow members and for the very great and valued friendships which I have formed among its members.

We are sure we can speak for all Dr. Walsh's many friends from all over the world in congratulating him on this recognition of a lifetime's service to lighting.

Lighting London's Traffic Routes

At the suggestion of the Ministry of Transport a committee was set up in 1958 to study methods of securing greater uniformity in the lighting of traffic routes within "the London Conurbation," i.e. the Metropolitan area and those parts of the Home Counties adjoining it which together form a vast, almost entirely built-up area. This committee has now issued an interim report of some 9 octavo pages. It

follows, and refers at length to the "Practice Notes for Street Lighting in London," prepared under the aegis of the Metropolitan Boroughs Joint Standing Committee and reviewed in *Light and Lighting* for September, 1958.

The present report, perhaps somewhat naively, asks urgently for research "to produce a more satisfactory basis (than lumen output per 100 ft.) for measuring the effectiveness of lighting in terms of visibility to road users." Then, using the lumen basis, *faute de mieux*, it recommends an absolute minimum of 5,000 lumens per 100 feet on all traffic routes, though many such routes, it states, should be lighted to a far higher standard and, indeed, to a standard above the upper limit suggested in the BS Code.

The committee does not express a decided preference for any particular light source, but it does recommend a relaxation of the upper limit of 25 feet on mounting height, with a proviso that the Royal Fine Art Commission should be consulted before greater heights are used. Central suspension is discouraged.

The recommendations on lighting-up times are interesting; sunset in winter and 30 minutes after sunset in summer is the general rule suggested and a graph shows how this would work out in practice. All-night lighting is strongly recommended, but if any reduction is made in the small hours of the morning, this should not bring the lighting below the minimum recommended in the report.

There is a long paragraph on control methods, with special reference to radio control which, the committee states, may soon become an accepted method. Rather surprisingly the only reference to cut-off lighting is under the heading "Miscellaneous Matters," and still more surprisingly the four lines devoted to it are damnatory with faint praise.

Will the report help towards the co-ordination of street lighting in the area covered by the committee both in its membership and in its deliberations? "'Tis a consummation devoutly to be wish'd" but only attainable "by the willing and voluntary acceptance of its findings by all the local authorities in the area which it covers." There is a significant sentence which refers to the MOT Departmental Committee's recommendation that consideration should be given to the responsibility for the lighting of traffic routes being confined to large administrative units. "Thoughts such as these," remarks the committee, "are still in the minds of Government Departments and others and it is as well to reflect on the alternatives should co-ordination and voluntary co-operation fail."

The report is obtainable, free of charge, from the Town Clerk of Hampstead (Hampstead Town Hall, N.W.3) who is the honorary secretary of the Consultative Committee.

Aluminium Columns

The results of the competition for the design of aluminium street lighting columns for Group A and Group B lighting arranged by the Aluminium Development Association were announced recently. The purpose of the competition was to encourage the evolution of good designs which would take into account aesthetic appearance, economy of construction and the advantages of aluminium.

Perhaps we had expected too much of this competition, but we certainly don't find the results at all exciting. Neither is the report of the assessors as published by the ADA very helpful; indeed it is not all that easy to make out who has won what. It would seem that the 1st prize of £250 goes for designs for a 25 ft. and a 15 ft. column by Jack Howe in conjunction with Reynolds T.I. Aluminium Ltd., and J. B. Dwight, who is with the civil engineering department of Birmingham University. Jack Howe is design consultant to the AEI Lamp and Lighting Co. Ltd., who are already using both his 25 and 15 ft. columns.

The assessors themselves were disappointed in the number and quality of entries and the 2nd and 3rd prizes were divided equally between F. J. B. Rowley, a student at the College of Art and Industrial Design at Newcastle, and S. L. Devlin, who is a student at the Royal College of Art in London. The same two gentlemen share the £75 students' prize.

IES Jubilee Lecture

Those who attended the four IES Golden Jubilee lectures in London last month took part in what was probably one of the best series of lectures ever put on by the IES whose standards in such matters are pretty high. Sir Lawrence Bragg had a full-house at the RI when he demonstrated to us the nature of light; Mr. L. J. Davies had even more demonstrations than the first lecturer and held out promises of even more lumens per watt in the future; Dr. W. H. Glanville put into one lecture the very many items of useful information on lighting and road safety which have come from the RRL during the last few years; and at the final lecture Mr. A. N. Irens gave us some facts to prove that better lighting does increase productivity, information which has been badly needed by the lighting industry, who, we hope, will make full use of it when the paper, with the others, is eventually published in the IES Transactions.

Two quotes from the lectures. The first from Sir Lawrence Bragg who told us that "science thrives on a rich compost of imagination and intuition." The second from Sir Alexander Fleck who, reminding ns that beauty lies in the eye of the beholder, congratulated the IES on ensuring that "the beholder can behold under good conditions."

Queen's Square, Crawley New Town. The lighting columns and lanterns have been carefully related to the overall design of this pedestrian shopping area which is one of the pleasant features of Crawley.

A.P.L.E. Conference, Aberdeen

Report on the proceedings at the 1959 Conference of the Association of Public Lighting Engineers.

AS in previous years, the third week in September saw members of the APLE assemble for their annual conference, this time in Aberdeen, the home town of the president-elect, Mr. Ronald Parker. The proceedings were opened on Tuesday morning, the 15th, by the Lord Provost, George Stephen, Esq., who was supported by the Chairman of the Watching and Lighting Committee, Councillor G. Roberts, and by the member of parliament for Aberdeen (North), Mr. Hector Healey, Q.C.

In his speech of welcome to the Association the Lord Provost paid a tribute to its secretary, Mr. Eric Evans, with whom, he said, it had been a real pleasure to work during the period of preparation for the conference. He referred to the pride taken by the citizens of Aberdeen in their public lighting, and to the very remarkable floodlighting under which the granite of the buildings showed up to great effect. Marischal College, often described as the most imposing white granite building in the world, was an outstanding example. He assured the Association that nowhere in the kingdom was the work of the public lighting engineer more highly thought of than in Aberdeen.

After expressing the thanks of the Association to the Lord Provost, the retiring president, Mr. Granville Berry, introduced Mr. Parker, who, he said, had a long record of valuable work, both as Lighting Superintendent of the City of Aberdeen and as a member of council of the Association. The new president was then invested with the chain of office. His expression of thanks for the honour conferred on him was followed by announcements that the new vice-president was Mr. F. C. Smith and that the next conference would be held in Folkestone from the 13th to the 16th September, 1960.

The Presidential Address

Mr. Parker began his address by referring to the fact that it was 25 years since the APLE had visited Aberdeen. He reviewed the Association's progress since 1934 and the changes that had occurred in the provision of street lighting in Britain during that time. Probably the most notable thing as regards the Association was its growth in strength and influence. Membership in all classes had more than trebled and the basis had been broadened by the admission to corporate membership of qualified staff serving with manufacturers of lighting equipment.

One of the principal objects of the Association was to facilitate the exchange of information and ideas on public lighting among its members and others interested. This could best be done by bringing together at an annual conference the elected members of local authorities who were responsible for providing the service, the officials charged with carrying out the work, and the designers and manufacturers of equipment. The success achieved in this way could be judged from the attendance figures. In 1934 there were 300 delegates representing 74 local authorities, while this year there were 1,021 delegates representing 328 local authorities and 15 gas and electricity boards, etc.

Another encouraging sign was the number of visitors from abroad who attended the conference each year. This was most valuable because lighting engineers in all countries had much to learn from one another. While it was agreed that this country led the world as regards technical standards in public lighting, we had tended to concentrate on the utilitarian rather than the aesthetic side. Abroad there was far more emphasis on the artistic appearance of exterior lighting, both by night and by day, and there we could learn a great deal. The President said that there was an increasing awareness by the general public of the aesthetic impact of our lighting installations on the visual scene and this might well lead local authorities to encourage their responsible officials to study good lighting wherever it was to be found. The APLE should support any such activity and perhaps initiate and organise appropriate tours.

Codes and progress

The year 1934, said Mr. Parker, was especially notable for the appointment of the MOT Departmental Committee whose final report, issued in 1937, had later formed the basis of the BSI Codes. The Report and the Codes together set the pattern of the lighting on most of our traffic routes and on a substantial part of the mileage of other roads. The Report, in addition to its technical recommendations, contained references to defects in the national structure of street lighting administration. It was regrettable that, apart from the contributions to cost which could now be made by the Minister of Transport under the Trunk Roads Acts, these defects still remained. A pleasing development during the period under review was the research on street lighting carried out under the aegis of the Road Research Board of the DSIR.

The speaker then went on to emphasise the necessity for more attention to the aesthetic aspects of street lighting. The Code, he said, gave guidance on how to achieve lighting that would enable people to see their way about the streets at night with safety and convenience, but too rigid an adherence to the letter of its provisions might sometimes be undesirable and lead to monotony. The public lighting engineer should remember that streets of historical or architectural interest were often viewed more by day than by night and he should be prepared to sacrifice some lighting efficiency for the sake of good appearance. Another matter which seemed to need more attention from lighting engineers was the treatment of streets other than traffic routes. Manufacturers said that for Group B lighting the only demand was for simple and cheap equipment; if public lighting engineers were more imaginative in their approach, better material would soon become available.

Training

It was only to be expected that the new president would refer to the training of public lighting engineers, for it is well known that this is a subject on which he feels very keenly. It is, in fact, an open secret that he was the moving spirit in the preparation of the Association's diploma scheme, so there was an understandable sadness in his remark that, although it had been in operation for several years, little interest had been shown in it. He attributed this to lack of recognition by local authorities, with the result that good candidates were attracted in other directions leading to greater rewards.

After a reference to the student class of membership of the Association and the considerable growth in the activities of the local sections, Mr. Parker closed his review with a brief account of the progress of street lighting in Aberdeen in recent years. This had been most noticeable since 1954 when it became necessary to relight Union Street and adjacent shopping streets. The installation of a high standard of lighting there led to a demand for improved lighting on traffic routes generally and as a result the Corporation had adopted a three year programme of lighting development which was later extended to five years, one year of which had still to run. This programme had resulted in the improvement to a generous Group A standard of about 20 miles of traffic routes. For the most part mercury lamps had been used; latterly the colour-corrected type had been extensively adopted.

Concluding his remarks with a look into the future, Mr. Parker said that the Association should not cease to press for the removal of administrative and financial deterrents to speedy progress in public lighting. It should endeavour to increase its membership and to extend the facilities available for training. Above all it should enlist the support of public opinion by installing lighting that was effective for its primary purpose and, while creating pleasant surroundings by night, in no way marred the beauty of the scene by day.

After a vote of thanks to the President for his address had been proposed by Mr. T. Wilkie, seconded by Mr. H. F. Cork and carried by acclamation, the Lord Provost officially opened the exhibition of street lighting apparatus arranged in the rooms of the Music Hall adjacent to the main hall where the meetings were held. Accompanied by the President he inspected the exhibits and the outdoor display of columns and mobile equipment in Golden Square and the streets leading into it.

Craftsmanship in Public Lighting

On Tuesday afternoon Mr. L. C. Rettig presented his paper with the above title. In it he laid emphasis on the need for the public lighting engineer to exercise his practical skill in the design of installations for all types of thoroughfares and in the selection of equipment suitable for the purpose. The tools he needed were, in addition to the Code of Practice and recognised text-books, various items of measuring apparatus. Among these Mr. Rettig included a wheel measurer, in place of the inconvenient 100 ft. tape, a simple form of height indicator and a siting gauge. Expressing a preference for working at a scale of 1/2,500, the author described an ingenious spacing gauge designed on the "lazy tongs" principle.

The craftsman lighting engineer, said Mr. Rettig, would often be called upon to exercise his judgment in arriving at a "wise compromise" between conflicting requirements. This was a matter on which the Code gave little guidance so that the engineer was left to establish his own personal code and its basis should be "no compromise" on anything that might at some future time be a contributory factor in an accident. No bend or intersection should be regarded as unimportant, nor should parsimony be allowed to dictate the adoption of the lowest standards of lighting permitted by the Code.

Turning to particular examples, the author dealt in turn with intersections on straight roads, conditions at bends and forks, double carriageways, tunnels and bridges, all lit to Group A standards. He rather summarily dismissed both the cut-off and the high-angle beam distributions and confined his attention to medium-angle beam lighting. With regard to intersections, where a departure from the provisions of the Code was called for it was essential to define the minor road and ensure that traffic from it had a clear indication of the junction. In a staggered lay-out, whatever the circumstances the distance between lanterns on the same side of the road should never exceed 300 feet. Intersections on bends required special consideration, while forks could often be treated as pairs of bends united at one end. Where a siting gauge was used to plan the lay-out it was essential to check the positions of the lanterns on site.

The wide open spaces

Under this heading Mr. Rettig included squares and circuses and abnormally wide thoroughfares such as were frequently encountered in older towns. The problem of the square, he said, could usually be resolved into a series of linked intersections with additional lanterns to give the necessary symmetry. In the really wide open space, where traffic tended to wander at will, the first thing to be done was to decide on a route of limited width within which it should be canalised as far as possible and then to erect a row of double-armed columns along this route, additional lanterns being placed at strategic points on the periphery.

For the lighting of dual carriageways, the provisions of the Code generally proved adequate but Mr. Rettig referred to the new system recently installed on part of the Glasgow-Edinburgh road where lanterns, each containing a 280-watt sodium lamp (two 140-watt tubes in a single envelope), were mounted at the outside kerbs. The mounting height was 35 feet and the spacing 170 feet, each lantern having an outreach of 8 feet. The planning was unorthodox but the results seemed to be satisfactory. In urban areas there was a growing tendency for the columns to be confined to the central reservations of dual carriageways.

The lighting under bridges and in tunnels was always a difficult problem. Under a bridge the mounting height might be restricted to 13 or 14 feet; cut-off lanterns could sometimes be recessed into the steelwork, and post-top lanterns had occasionally proved successful.

Turning to Group B lighting, Mr. Rettig said that the craftsman would attack this with as much enthusiasm as he displayed over a Group A scheme. He took this opportunity of pressing for recognition of a class of lighting intermediate between Group A and Group B, using light sources giving some 4,000-6,000 lumens and a mounting height of about 20 feet.

The craftsman's materials

In the earlier sections of his paper Mr. Rettig had dealt with the tools of the craftsman and his methods. Now he turned to the materials, *viz.*, lamps, lanterns, columns and brackets. With regard to the first he gave a table in which he set out, for five different types of lamp, the total wattage

RECENT STREET LIGHTING INSTALLATIONS

Chiswick

The Chiswick Flyover which was opened recently consists of dual 24 ft. carriageways linking the Great West Road with the Cromwell Road Extension and spanning three main roads. The junction of the through road of the flyover is lit by 72 Revo 'Silverblue' aero screened 400-watt mercury lamp lanterns mounted at 25 ft. on double arm columns on the central 3 ft. reservation and single arm columns on the outside the spacing being nowhere greater than 100ft. The slip roads are lit by Revo cut-off mercury lanterns at 80-90 ft. spacing. The columns were supplied by Concrete Utilities Ltd.

Mersey Tunnel

The lighting of some sections of the Mersey Tunnel has recently been improved by converting existing built-in tungsten lamp fittings to take four 15-watt fluorescent tubes. The conversion unit was designed by Philips Electrical Ltd. The large picture was taken looking towards a newly lit section and the smaller picture below looking from the new into the old.

needed at each lighting point in order to obtain lighting of four grades, designated respectively as Group A Plus, Group A, Intermediate and Group B. The spacing appropriate to each grade was also given. The freedom of choice of materials depended on whether the craftsman was or was not commercially employed and Mr. Rettig made an interesting assessment of the pros and cons of design by a commercial craftsman and one entirely free from any such connection.

In making any selection of lanterns and columns, proper regard should be paid to design. The work of the Council of Industrial Design had been of great value and just as the craftsman followed the technical provisions of the Code, so he would select equipment that had the seal of approval by the CoID. A much-to-be-desired reduction in the amount of equipment on paths could often be effected by using wall-mounted fittings and Mr. Rettig showed some examples where this had been done successfully.

In the final section of his paper the author referred to adaptations which, he said, called for a very cautious approach to ensure that the final result would be aesthetically satisfactory. He also mentioned the individual design of lanterns required for special purposes and showed two examples, one intended for lighting a war memorial, the other a "Provost's Lantern."

A fluorescent town plan

After giving a summary of his paper, Mr. Rettig illustrated many of his points by means of a large scale plan of a group of roads, with bends and intersections, a square, roundabouts and tunnels. This plan was drawn in luminescent material and Mr. Rettig's arguments could be clearly followed as he moved along placing fluorescent ping-pong balls at every position where a lamp should be.

The discussion was opened by Mr. Colvin who said that it was now essential for a public lighting engineer to be also a qualified electrical engineer. Further, his craftsmanship should not be confined to new installations; he had also to be a craftsman in maintaining existing lighting. Expressing the opinion that greater mounting heights such as 35 feet were suitable, not only for dual carriageways but also for other wide thoroughfares, he said that any installation erected now would probably last 15 years or more and it should therefore be planned with an eye to traffic conditions 15 years ahead.

Mr. H. Carpenter expressed some apprehension about the 170 ft. spacing mentioned by Mr. Rettig. Might this not produce cross-banding that would be troublesome to the motorist? He urged that the lighting engineer should have freedom, within certain limits, to adopt the mounting height he felt to be appropriate. Mr. J. R. Brodie objected to the word "craftsmanship." A craft was a trade whereas public lighting was part of the profession of municipal engineering. He mentioned difficulties with property owners over the siting of posts.

Mr. A. W. Christie took the author to task for saying that high-angle beam lighting was out-moded; such installations were, in fact, still being put up, although it was true that modern road surfaces made this form of distribution less advantageous than it used to be. With regard to cut-off lighting, he said that while this was not greatly favoured in Great Britain, it was very widely used abroad. He referred to comparative trials on experimental roads at Brussels, one with non-cut-off and the other with cut-off lighting. There was, he felt, a good future for the latter, especially in view of the probable use of high-power sources at greater mounting heights. Mr. H. F. Cork asked the author's opinion of lighting a roundabout from a high central column, so as to avoid the confusing multitude of posts generally used. Mr. J. M. Waldram suggested as a useful tool the "dendrometer" often used for measuring the heights of trees. He said, too, that a miniature camera could give the lighting engineer a great deal of valuable information which was not shown on any plan. The BSI Committee responsible for the Code was now busy on a revision and would most certainly take notice of the various suggestions that had been made.

In his reply the author said that the long spacing in the dual carriageway installation was rendered unobjectionable by the greater mounting height. Referring to Mr. Brodie's criticism, he declared himself proud of being a craftsman and of using his hands. One disadvantage of lighting a roundabout from a high central column was that the light was everywhere incident at no great angle from the vertical, so that silhouetting was much less marked.

A vote of thanks, proposed by Mr. Waldram and carried by acclamation, closed the session.

The Annual Luncheon

On Wednesday, after members had taken the opportunity afforded by a morning free from meetings to visit the exhibition, they assembled in the Beach Ballroom for the Annual Luncheon, under the chairmanship of the President. The chief guest was to have been Lord Forbes, Minister of State for Scotland, but as he was now prevented from taking part in any such function until after the general election, he was represented by Mr. R. D. M. Bell of the Home Department which, since 1956, had taken over from the Ministry of Transport responsibility for the road system in Scotland. As was fitting north of the Border, the President and the principal guests were piped in after the rest of the company had taken their places.

The toast of the Corporation of the City of Aberdeen and the Guests was proposed by the Association's Vice-President, Mr. F. C. Smith, who referred to the kindly welcome which the citizens of Aberdeen always showed to visitors and which had been expressed with such warmth and sincerity by the Lord Provost on two occasions. (These were the opening ceremony and the official reception at the Beach Ballroom on Tuesday evening.) He then mentioned by name a number of guests who were members of departments or organisations with which the Association had happy and helpful relations. After some words of special welcome to the ladies, Mr. Smith concluded by wishing Aberdeen all the prosperity its Lord Provost could possibly desire for it.

In his reply the Lord Provost again spoke appreciatively of the work of the public lighting engineer which had recently revealed architectural beauties in the City hitherto quite unsuspected. This subject of the contribution to beauty which could be made by good lighting was taken up by Mr. Bell when he proposed the toast of the Association. Not only had there been tremendous technical improvements during the last 35 years, so that the roads could be made safer and more convenient at night, but good lighting could enhance the appearance of a town and lend some charm even to the most prosaic building. He mentioned two experiments that had recently been carried out in Scotland. One, at Longniddry on lighting from a low level, had helped considerably in deciding on the form of lighting to be installed on the Forth road bridge. The other was the dual carriageway lighting on a section of the Glasgow-Edinburgh highway (described by Mr. Rettig in his paper on Tuesday afternoon).

RECENT STREET LIGHTING INSTALLATIONS

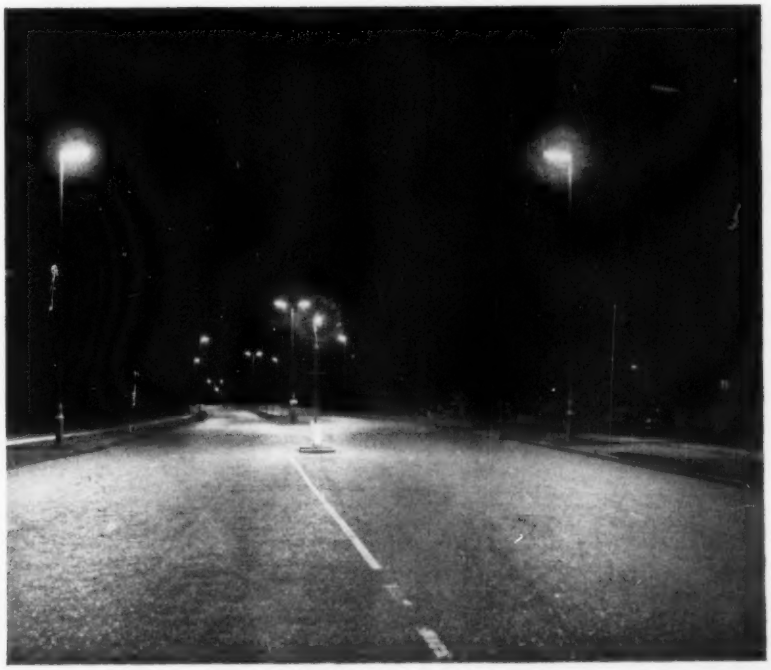
High output sodium lamp installations

Leicester

This is an early installation of 24 AEI 'Amberline' lanterns using the new 200-watt linear sodium lamp and has been achieved by converting a former installation by the attachment of special twin bracket arms to existing columns to give a mounting height of 35 ft. The spacing is 120 ft. along the central reservation of the dual carriageway. The light output per 100 ft. is 11,600 lumens.

Twickenham

This is another experimental installation of the AEI 'Amberline' 200-watt sodium lantern. There are 10 units mounted at 35 ft. on tubular steel extensions to existing columns. The average spacing in this case is 183 ft.



High output sodium lamp installations (continued)

Ballieston

The first major experimental installation of 280-watt Philips sodium lamps was put into service during the summer in a ¾ mile section of the main Edinburgh-Glasgow road at Ballieston. The road has two 30 ft. carriageways divided by a 30 ft. central reservation. Special Stewarts and Lloyds columns give a mounting height of 35 ft.; the lanterns are Eleco 'Golden Ray 280'. Columns are spaced at 170 ft. on the outside of each carriageway with an 8 ft. overhang. Illumination on the road varies between 2.25 and 0.6 lm/ft².

Coventry

The illustrations here show an experimental installation of Siemens-Ediswan 'Ospray' lanterns each housing one 200-watt linear sodium lamp. Each carriageway is 22 ft. wide; there is an 18 ft. central reservation, 6 ft. grass range and 8 ft. cycle tracks. Mounting height is 35 ft. on Poles Ltd. 'Adastra' columns; the spacing is 100 ft. staggered with columns on the outside of each carriageway. There is a neighbouring installation of Siemens-Ediswan 'Oline' lanterns which house two 200-watt linear sodium lamps.

The President, in his reply to the toast, said that there had been notable improvements since the war in traffic route lighting and soon, perhaps, it would be time for them to start thinking about lighting the open road. Although this might not be called for in more sparsely populated areas, elsewhere there was often very little really open road between towns and the lighting of inter-urban highways might well be regarded as essential.

After the luncheon members took coaches for an excursion through the magnificent Deeside country as far as Braemar, where high tea was served at the Fife Arms Hotel.

Fifty Years of Lighting

The session on Thursday morning was a special one in which the President of The Illuminating Engineering Society, Mr. C. C. Smith (also a past-president of the APLE) gave a "Golden Jubilee" address in which he reviewed the progress made in all fields of lighting during the half-century since the foundation of the IES in 1909. This review was divided into four parts dealing respectively with fundamental research, applied research, materials and equipment and, finally, lighting applications. Remarking that the Greeks and Romans knew nearly as much about lighting as was generally known in the 18th century, Mr. Smith said that the first sign of the momentous changes that were soon to take place was the painstaking research of Swan and Edison which resulted in the invention of the filament lamp. Since their time research on light sources had been pursued relentlessly, so that the efficiency had been raised progressively from less than 9 to over 90 lumens per watt between 1909 and 1959.

During the last 50 years there had been much fundamental research on the levels of illumination required for visual tasks, on the phenomena of glare and on brightness and the appearance of the visual field. Mr. Smith mentioned in this connection the pioneering work of Lythgoe, Stiles and Luckiesh and the idea of basing illumination values on task analysis, first put forward by Beuttell and actively pursued by Weston. He said that probably the work most likely to affect lighting design in the near future was that of Hopkinson on the scale of apparent brightness.

Other fundamental research carried out during the period under review was that leading to the development of a primary standard of light and the determination of the curve defining the sensitivity of the eye to radiation of different wave-lengths throughout the visible spectrum.

Applied research

Pointing out that, to be of practical value, the results of fundamental research must necessarily pass, *via* applied research, to the practising lighting engineer, the lecturer referred to the IES Code for Lighting in Buildings as an outstanding example. This document, first published in 1936 as a list of "Recommended Values of Illumination," had passed through a number of editions, culminating in the much revised and enlarged Code of 1955.

An excellent example of the evolution of the lighting art through its three phases of fundamental research, applied research and practical application was provided by the "designed appearance" method of lighting design due to Waldram, and its use in the lighting of Gloucester Cathedral, with the remarkably beautiful results to be seen in the slides which were shown at this point in the lecture.

Another example of applied research was the use which had been made by Wilson, Waldram and others of the principle of silhouette vision in street lighting. Previously the value of illumination on the road surface had been taken as an indication of the effectiveness of a street lighting system, but in the report of the Departmental Committee on Street Lighting, issued in 1937, this criterion was abandoned in favour of the conception of uniform road surface brightness as a background for seeing objects on the roads at night; the era of street lighting by silhouette had arrived.

Materials and equipment

Of the many items under this heading in which great improvements and developments had taken place during the last 50 years, Mr. Smith selected three, *viz.* plastics, glass and lamps. Plastics had, indeed, been born only just outside the period under review, for the original patents of Baekeland and Swinburne were taken out in 1907. Although plastics of the bakelite type were still of importance in the lighting industry, it was not until the appearance of the clear plastics, particularly methyl methacrylate, that these materials made their real entry into the lighting world. Now they were probably the most important of all lighting materials.

Developments in glass manufacture had been much less spectacular; the most striking were the production of toughened or armour-plate glass and the great improvements in furnaces which had led to the melting of more refractory types of glass resistant to weathering and to chemical attack. The actual manufacture of glass had undergone remarkable changes during the last 50 years and Mr. Smith showed a number of slides illustrating the methods of mass production now employed.

Lamps

It was interesting to note that the year 1909 saw the invention by Coolidge of the sintering process which made possible the tungsten filament lamp. The vacuum lamp was followed in 1913 by the gas-filled lamp with its coiled filament and this, with its logical extension the coiled-coil filament, was the last major development in filament lamps, although built-in reflectors, silica coating and the waterproof pressed glass now used for underwater operation had been introduced subsequently.

Gas-discharge lamps began with the Cooper Hewitt mercury vapour lamp and the Moore tube but the first sodium lamp had to await the production in 1922 of a special glass resistant to attack by sodium vapour. At first the efficiency was about 30 lumens per watt, but today the 140-watt lamp of this type produced approximately 11,000 lumens. Mercury vapour discharge lamps, too, had been greatly improved since their introduction in 1933, while the fluorescent lamp which, when it was first introduced just before the war, had an efficiency of about 20 lumens per watt now gave over 70 with a life at least three times as long.

At this point in the lecture a number of the lamps mentioned were shown in operation. The first was a carbon filament lamp, the last a xenon lamp giving a quarter of a million lumens at an efficiency of 25 lumens per watt. One of the new sodium lamps was shown.

Lighting practice

The broad fields of lighting application selected for mention were street lighting and lighting for travel generally, light for entertainment and light for work. The milestones in street lighting, said the lecturer, were first the BS Specification of 1927, then the experiments arranged by Colquhoun at Sheffield in 1928 and finally the Departmental Committee's report in 1937, followed by the Codes of Practice. The tremendous progress that had been made was demonstated by means of a number of slides. Mr. Smith also

mentioned advances in aerodrome lighting, particularly the work of Calvert, and illustrated his remarks with a short film showing how the lights at an airport appeared to a pilot as he came in to land. An account of lighting on modern passenger liners and on other transport vehicles, too, was illustrated by a series of slides.

Under the heading of entertainment the lecturer spoke first of theatre lighting and the immense strides made in this field during the last 50 years, with particular reference to the dimming of fluorescent tubes which he illustrated with a model. He then turned to floodlighting and to lighting for sports and games. Lighting for work, he said, although probably the least exciting was certainly the most important field of application. He mentioned shop lighting and the rapid progress made, especially since the introduction of the fluorescent lamp. In factory lighting, the work of the Home Office Committee had resulted, not only in the enactment of statutory requirements but also in a greater appreciation of the value of good lighting in industry. There was, however, no room for complacency and much progress had still to be made. In offices, too, conditions were often far from satisfactory and the recommendations of the Gowers Committee had indicated the need for legislation with regard to lighting. In mines progress had been slow and somewhat disappointing.

In conclusion Mr. Smith gave another warning against any complacency that might be induced by the great advances which had taken place since 1909. What was considered sufficient lighting some years ago, he said, could now be increased manyfold with the cheaper and much more efficient light sources available today.

This point was underlined by Mr. Lennox, who, in proposing a vote of thanks to the lecturer, mentioned that the amount of light obtainable for a penny today was seventy times that which could be bought for the same sum 50 years ago.

Well done, Mr. Smith!

This lecture was a remarkable performance. It could easily have been a somewhat dull account of events in lighting over the last half century. Actually it was a lively discourse, well interspersed with slides and demonstrations, which held the rapt attention of a large audience for over 90 minutes without a sign of flagging interest.

The Planner and Street Lighting

Thursday afternoon saw what was the longest and, perhaps, the liveliest session of the Conference, with plenty of plain speaking during the discussion and private argument afterwards. Mr. J. E. Barlow, an architect and the Director of Town Planning in the City of Aberdeen, presented his paper entitled "A Planner Looks at Public Lighting" in which he made a strong plea for co-operation between the town planner and the public lighting engineer. The planning authority, he said, was concerned with the visual scene in a thoroughfare. This depended not only on the buildings but also on such things as bus shelters, road signs, litter bins and, most important of all, the street lighting.

There had been great technical advances in public lighting since the war; there had also been improvements in design and a growing sense of its importance, with an appreciation of the work of the Royal Fine Art Commission and the Council of Industrial Design. In this connection it was important to realise that good design was applicable not merely to any particular thing by itself, but to that thing in its destined surroundings. Nothing, said Mr. Barlow, should usurp the control of the man actually responsible for the installation, the lighting engineer, but he might well be advised by someone who, by training and experience, was vitally concerned with design in relation to surroundings.

The general impression produced by public lighting in Britain today was of technical efficiency combined with a lack of visual sympathy for surroundings, of aggressively over-designed columns marching down streets, of concrete where there should be no concrete, of drab housing areas made still more drab by heavy poles carrying fittings reminiscent of pimples, of "local authority" green paint and of "curlycues" added to poles as superimposed decoration. Sometimes, however, it was clear that there had been the co-operation he advocated. This was particularly true of some of the new towns.

Concrete posts

After an analysis of the elements to be considered when attempting an assessment of present-day public lighting, Mr. Barlow devoted a section of his paper to the use of concrete poles. Describing this as by far the most controversial aspect of public lighting at the present time, he said that the material itself was unhelpful and so the greatest care was needed in choosing a suitable cross-section, with a gradual thinning towards the top and perhaps the subtle bulge characteristic of the classical column. The shape of the bracket, too, was vital and so was its junction with the pole.

Concrete had no place in central urban areas, according to Mr. Barlow, but it could be used in areas of more open development and on major radial routes leading into the country; in towns it should give place to the metal pole of lighter construction. Rather surprisingly, Mr. Barlow here referred with approval to the Victorians who, he said, looked on public lighting as what it was, *viz.*, an essential part of the town, to serve and contribute to the appearance of the town.

Next came a comparison between the treatment usually accorded to traffic routes and that given to lesser thoroughfares. Again surprisingly the former came in for praise and the latter for condemnation. This was because the manufacturers of fittings had, in the author's opinion, evolved several designs for use on major routes which were satisfactory in shape and proportion. Their size, too, related well with the height and sweep of the standards that supported them. On side roads, however, the fitting generally looked like a blob or pimple hanging disconsolately on the end of a pole several sizes too large for it. It was unfortunate that the fundamentally more pleasing post-top fitting was not used more frequently.

Wall mounting

Not unnaturally, in view of the comparatively early use of wall mounting in Aberdeen, Mr. Barlow devoted a section of his paper to this type of street lighting which, he said, presented its own particular problems. By day the lights had to relate suitably to the individual buildings that supported them, while by night they had to compose well as a whole. The difficulties met with in the Union Street installation, and the way in which they were surmounted, were dealt with in some detail, principally because they illustrated the sort of co-operation between lighting engineer and planner which the author was so strongly advocating. Another example was the main street of Haddington in East Lothian where the fittings, unlike those in Aberdeen, were half-round and attached close to the building faces. Another system which avoided the erection of poles

RECENT STREET LIGHTING INSTALLATIONS

Sevenoaks

The main roads at Sevenoaks have recently been relit using fluorescent tubular lamp lanterns. For the majority of roads GEC tapered 'Three-Eighty' lantern has been used mounted on GEC octagonal tapered steel columns and tilted at 12½ deg. above the horizontal. In the High Street and London Road where footpaths are narrow wall mounting lanterns housing two 5 ft. 80-watt tubes are used. In St. Botolph's Road which is heavily lined with trees and is one of the most attractive residential roads, special vertical post-top lanterns on 15 ft. octagonal steel columns are used (see picture bottom right). These lanterns house two 2 ft. 40-watt tubes. Similar lanterns are used in the Upper High Street.

Crawley

A photograph of the lighting in Queen's Square, Crawley, is shown on page 316. This square is a pedestrian shopping area laid out with trees, flower-beds and a fountain. AEI 'Orient' tungsten lamp lanterns are used in groups of three on 16 ft. tubular steel columns; the canopies and brackets are enamelled in different colours. The picture on the right shows an installation of AEI fluorescent post top lanterns which are used extensively on the principal streets near the town centre. These lanterns house four 5 ft. 80-watt lamps mounted on Stanton 25 ft. concrete columns spaced approximately 120 ft. apart.

City of London

The London Wall section of Route 11 through the City of London was opened in July. The lighting is by GEC octagonal lanterns of the dual City of London type each containing four 80-watt fluorescent tubes; columns are GEC octagonal tapered steel spaced at 78 ft. along the central reservation.

Glasgow

The picture on the right shows an installation of Philips 400-watt colour-corrected mercury lamps in George Square, Glasgow. Two or three Eleco lanterns each housing one lamp are mounted on steel columns.

on the footway was suspension from catenary wires but the effect by day was sometimes not very satisfactory.

Areas of special character or having old buildings of interest required very careful treatment. As examples Mr. Barlow mentioned two bridges on the outskirts of Aberdeen, the recently widened Bridge of Don and the sixteenth century Bridge of Dee, scheduled as an historic building. The former had now two carriageways with a central reservation and it had been possible to light it by means of a central row of standards with double brackets. The latter had presented a very difficult problem as it was only 27 feet wide and any major route columns would have been quite out of scale, however well designed. The solution here had been to adapt the existing Victorian gas standards and lanterns, which had considerable character and were of a scale and appearance well in keeping with their surroundings.

Finally Mr. Barlow dealt with the subject of painting and finish, beginning with a condemnation of "mid-green" paint which he described as "that most dreary of colours." The colour used, he said, should depend on the character and materials of the environment. For example, against the granite buildings in Aberdeen, grey had been found a very suitable colour, although in the period surroundings of Old Aberdeen black had been thought preferable. Again on the old Bridge of Dee a very dark colour was used, but the crowns and certain other features of the lanterns were picked out in gilt to give some richness of effect.

After giving a short summary of his paper, Mr. Barlow showed a large number of slides in which posts and fittings of various designs were seen in surroundings of widely different characters. In his commentary the author brought out many of the points he had made in the paper.

Aesthetics and vandalism

The discussion was opened by Mr. F. H. Clinch who congratulated the author on his courage in venturing among such a gathering of "vandals." Remarking that aesthetics and technical excellence were not necessarily opposed he declared that a street-lighting fitting was a thing of beauty if it fulfilled its function effectively. The new sodium lamp, he said, would create new problems, particularly as regards colour and the mounting height to be adopted. He took exception to the author's condemnation of concrete and said that in medieval surroundings it was no worse to use a modern fitting than one that was 50 years old. He agreed, however, that co-operation between the planner and the lighting engineer was most desirable.

Mr. J. T. Grundy thought that efficiency should never be sacrificed to aesthetic appearance. An individually designed lantern was always extremely expensive; while co-operation with the planner was very desirable, the lighting engineer had to use the equipment available.

Mr. D. Clark showed some slides of street lighting in Norwich where wall-mounted fittings of very unobtrusive design had been used successfully. He strongly supported co-operation but said that it should be between a qualified electrical engineer and an architect planner.

Mr. Peter Whitworth of the Council of Industrial Design supported the author in his plea for co-operation and said that it was most encouraging to notice a growing feeling that all was not well with the street scene. Street lighting columns tended to be more noticeable than other street furniture because they were repeated at more or less regular intervals. He mentioned that the CoID was to hold in 1960 an outdoor exhibition of street lighting equipment.

Mr. F. H. Pulvermacher showed several slides of lighting installations, some good and others bad, and then Mr. J. R. Brodie made a forthright attack on planners and planning. As to co-operation, he would have none of it, declaring that the specialist who asked for advice was self-confessedly incompetent. Other critics were Mr. P. H. Renwick who said that the appalling death-roll on the roads made safety the paramount consideration, while Mr. R. J. Fothergill thought that planners did not pay sufficient attention to technical requirements.

After the President had closed the discussion he invited Mr. Barlow to reply. Making the general point that good appearance resulted from good design and the use of appropriate materials, with function as the basic consideration, the author said that he was not against concrete as such, but he condemned the way in which it was often used. There was, he felt, a real danger if matters of design were settled by administrators on financial grounds, or by manufacturers, instead of by the man on the spot who should be the best judge of what was most suitable.

A vote of thanks, proposed by the immediate past-president, Mr. Granville Berry, and carried by acclamation, concluded the session.

Column and Lantern Erection

At the last technical session, on Friday morning, Mr. K. V. McKenzie presented a paper to which he had given the title "Some Practical Aspects of Street Lighting Column and Lantern Erection." In it he followed the work of the erector from the preliminaries which preceded the signing of the contract to the final completion of the job. He began by saying that some local authorities employed an erection contractor while others preferred to do the work themselves by direct labour. The results could be equally good in either case.

Among the vital preliminaries mentioned by the author was consultation between the erection engineer and the local authority's engineer and this should take place at as early a stage as possible. In fact it might sometimes be necessary to put up a trial installation in order to enable the responsible committee of the Council to decide on the form of lighting to be installed. A decision was required, too, on whether or not trial holes should be dug. Mr. McKenzie was strongly in favour of them, especially where underground services were numerous, for then the form of root required at each position could be ascertained before the columns were ordered and there would be no delay while special roots were being obtained after the bulk of the order had been delivered.

It was essential for the erector and the engineer to get together as soon as possible after the contract had been signed in order to plan the work, to settle such details as distance from kerb edge to column, the extent of temporary reinstatement required, the accommodation available for vehicles and a host of other matters. With this information the erection engineer could give detailed instructions to his ganger for carrying out the work. It was necessary, too, to contact the different bodies with services underground which might be disturbed during the erection, e.g., the gas and electricity boards, the water board and the GPO.

With regard to the erection team there were two schools of thought. Some preferred the team to include an electrician so that columns, brackets and lanterns could be erected together. For various reasons the author preferred to have a team which was concerned solely with putting up the columns and brackets, and an electrical team follow-

ing on afterwards, fitting and wiring the lanterns, lamps and auxiliary gear.

Of the erection vehicles the most important was the mobile crane which should give 30 feet clear from ground to hook. The second vehicle was articulated, with a platform some 25 feet long, and should be capable of carrying a load of 10 tons.

The process of erection

The author explained how erection was actually carried out, showing a series of slides in which the successive stages were illustrated. Apart from the straightforward dropping of the column into the hole and its adjustment for position and verticality, the use of spade or crank roots and of raft root foundations to avoid disturbance of underground services was explained.

Turning to the work of the electrical team, Mr. McKenzie described the transportable test set carried by each team. This consisted of a simple rotary convertor energised by two 12-volt accumulators in series and giving 250 volts AC (adjustable down to 200 volts), 50 cycles. With this set the electrical team could test each column as it was wired to ensure that the lamps, gear and wiring were all satisfactory.

The author mentioned a number of special problems which were met with from time to time by the erection engineer. One was the fitting of screens to the lanterns in order to prevent the light from interfering with the recognition of railway signals. This, said Mr. McKenzie with some appreciation, often led to a trip on the footplate of an engine to see the light from the driver's point of view. Then there was the removal of obsolete and redundant columns and here the speaker showed some interesting slides of the extent to which corrosion was sometimes found to have taken place. Further, it was not unusual that underground services had been run close to the columns after they had been erected so that to remove them whole meant a risk of disturbing these services and it was often more satisfactory to cut the column off at 9 inches or so below the surface of the ground.

The final section of the paper was devoted to what the author called "the legal aspect," comprising such matters as the scope of the contract, the need for insurance cover of various kinds, including accident risk both to workers and to the public.

Opening the discussion, Mr. E. J. Whitcher, of the London Electricity Board first emphasised that the Board was not a lighting authority. He said that of the two plans mentioned in the paper for carrying out erection work, the employment of a contractor was the cheaper and he expressed interest in the way Mr. McKenzie recruited his erection teams. Consultation with the electricity board at the earliest possible moment was most important. He agreed with the author in his preference for dividing the electrical work from the erection proper, but said that the present-day tendency was to carry out both parts of the job at the same time.

Mr. J. T. Grundy noted that the author had referred only to metal spade roots and asked whether he had any objection to concrete spade roots. Similarly, in a written communication read by Mr. Boydell, Mr. D. Clark asked why the author had shown only a backward crank root, although forward cranks were sometimes more suitable. He doubted whether a spirit level was really adequate for testing the verticality of a column and preferred a more positive check.

After comments on various points by a number of other speakers, the author replied to the questions which had been raised. He described how his four teams had been recruited and trained and gave a further reason for preferring a separate electrical team, *viz.*, that this arrangement was more flexible, enabling such jobs as, for example, a conversion from gas to electricity where no new columns were needed, to be carried out without breaking up a team. He denied having any objection to concrete spade roots or forward cranks; although he had not mentioned them he used them wherever they were appropriate. With regard to the verticality of columns he said that besides the check with a spirit level, there was always a final inspection, in company with the local engineer, to ensure that the appearance was satisfactory. (Not only were the columns vertical, but they were *seen* to be vertical.)

After a vote of thanks proposed by Mr. W. Robinson and carried by acclamation, there was a short adjournment and then the audience re-assembled for the closing session. Following an expression of thanks by the President, on behalf of the Association, to all those who had contributed to the success of the Conference, and a vote of thanks to the President and Mrs. Parker, proposed by Mr. F. C. Smith, the Lord Provost closed the proceedings with what he claimed was his fifth speech expressing appreciation of the Association and its work, as well as good wishes for its future progress and prosperity.

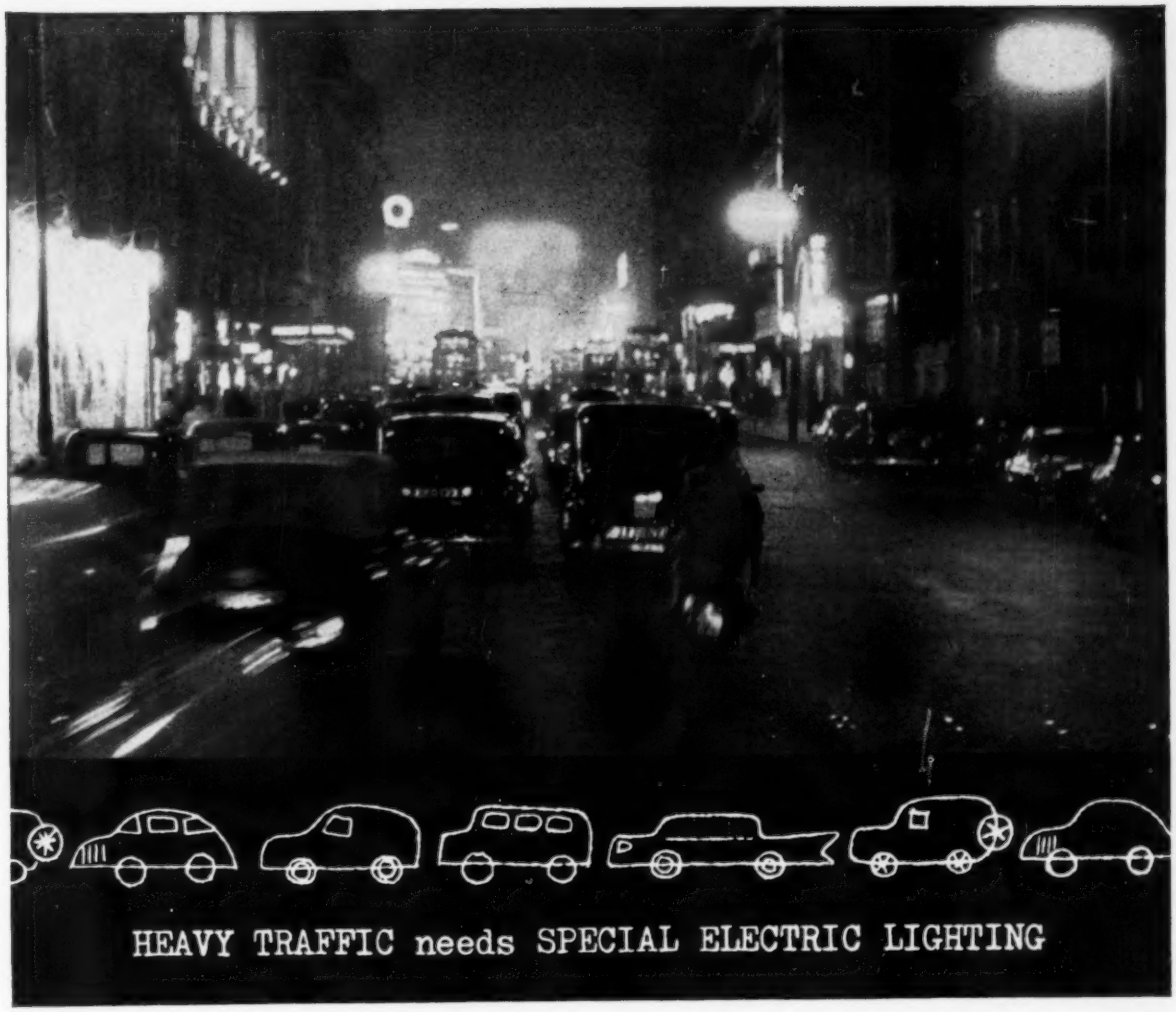
A very useful innovation this year, well worth noting, was the issue to delegates of a "Guide to a Selection of Public Lighting Installations in the City of Aberdeen." This gave full technical details of 44 street lighting installations and 8 floodlighting displays, and included sketch maps with suggested itineraries taking in the majority of the streets mentioned.

Animated Floodlighting at Aberdeen

A new system of floodlighting was demonstrated by The General Electric Co. Ltd. in Aberdeen at the time of the APLE Conference.

"Anilume", as it is called, is a simply operated modern technique for the floodlighting of all types of buildings. Colour changes, which can be effected by remote radio control, bring a new versatility into this type of lighting holding the attention of spectators and enhancing the visual impact of modern and ancient architecture. The technique also combats a criticism often raised against the floodlighting of buildings, namely, that the spectator appeal is short lived after the first switching on.

Three buildings of different styles were chosen for the demonstration of "Anilume". The Marischal College in Broad Street is built of granite, which has good reflecting properties. Its principal features for floodlighting are the strong vertical lines of the columns and windows, and the pinnacles decorating the top of the facade. Here radio controlled "Anilume" was used to suggest the building's appearance at different periods of day and night—sunrise to moonlight—the effect being achieved by using different banks of floodlights and varying colours. At Her Majesty's Theatre which is a much smaller building where it was considered that spectacular effects were appropriate. Colour and fairy lights were used to capture the varying moods of the theatre in a lighting sequence representing the dance, mystery and storm. The third building was the Salvation Army Citadel in Castle Street which has twin circular towers and occupies a commanding position. The object of the demonstration there was to show the importance of directional lighting and the way in which colour can enhance curved structures in a restrained but effective manner.



On roads carrying a high density of traffic, Special Electric Lighting is an essential in maintaining a speed sufficient to keep traffic on the move.

In ordinary street lighting conditions, this picture would not have been possible. With *Special Electric Street Lighting*, traffic is kept moving safely at a high density because of the greater safety factor.

The number of motor vehicles on the roads increases by 500,000 every year. Road accidents are increasing. Only the most efficient lighting can move traffic over major roads and help to minimise the night-time hazards of over-crowded highways.

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Exhibition of Equipment at Aberdeen

Some notes by W. Robinson

This year's APLE exhibition was smaller and elbow room was at a premium. Congestion was added to by the circumstance that the route to the conference hall was *via* the exhibition; the result was a continued air of liveliness and bustle which must have raised the spirits of exhibitors and certainly did no harm to the conference.

At first glance there seemed to be little that was new or exciting on display but a little delving revealed interesting features which, rather than a comprehensive review of exhibits, form the basis of these notes.

Lamps

Highlight of the show was the uprating of sodium lamp efficiency and the introduction of the linear 200-watt lamp. The AEI Lamp and Lighting Co. Ltd. showed their version for which they claim an efficiency of 100 lumens per watt. The GEC also showed one but they are not yet, apparently, in full production. Philips showed their V-tube version of the 200-watt lamp with a claimed initial efficiency also of 100 lm/W. They, however, have gone further with claims of efficiency increases throughout their entire sodium range of 25 to 40 per cent. There can be no doubt but that the other lamp manufacturers will shortly follow suit on the, by now, well-known follow-my-leader principle. While this is no doubt a perfectly reasonable procedure one cannot help reverting to the theme of an independent photometric testing laboratory for the lighting industry as a whole—not, be it said, as a check on manufacturers' claims but as a service both to major users of lamps and equipment and to the many equipment manufacturers who do not possess photometric laboratories.

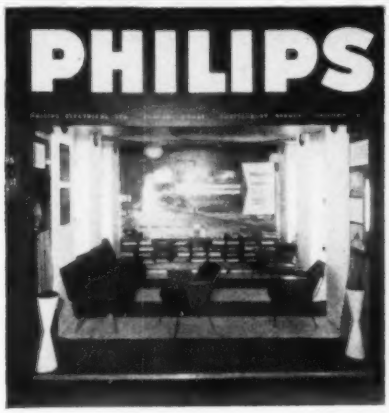
Coming back to the exhibition, there was little else which is new in the lamp field. The 400-watt MBFU reflector lamp was shown by the GEC and Philips and promises to be very useful indeed, inside or outside, where minimum maintenance can be expected.

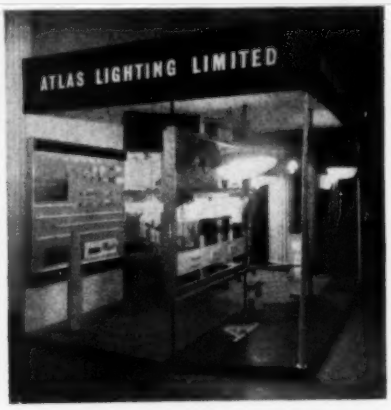
Lanterns

Siemens Edison Swan showed their "Oline" lantern, to house one or two linear 200-watt sodium lamps, in both reflector and refractor types, and their "Osprey" range. An interesting innovation by the same firm was a kit for conversion of gas lanterns to house filament, sodium or mercury lamps.

The GEC showed, in addition to their normal range, a new post top mounted lantern for 2 or 4 x 3 ft. fluorescent lamps with a 15 deg. lift above the horizontal; a decorative Group B post-top lantern and a post top lantern for 60-watt sodium; a 3 by 80-watt fluorescent lantern with extruded aluminium body and a glass-fibre lantern for the 3 ft. linear sodium lamp.

Revo's display of 'Horizon', ' Sol-dor', 'Silver Gold' and cut-off lanterns was augmented by the new 'Halcyon' range of lanterns with fibre glass canopies for 2, 3 or 4 by 80-watt fluorescent lamps, the post top Junior 'Soletern' for 2 by 2 ft. fluorescent lamps and the 'Eastbourne' for 250-watt MBF lamps. Also shown was the 'Canopy' lantern based





Above and right. The Philips, Atlas and Revo stands.

Below, two views of the outdoor exhibition.

Facing page. Top, The Lord Provost of Aberdeen opening the exhibition. Centre, a general view of the crowded exhibition hall. Bottom, Mr. J. T. Grundy, The Lord Provost, Mr. Hector Hughes, Mr. Ronald Parker (President), Mr. Eric Evans and Mr. Ilsley on the Siemens Edison Swan stand.

on the original designed for the promenade at Douglas, I.O.M.

Also to be seen were the AEI "Amberline" lantern with the new, bracketless, post top mounting; the Eleco range, including the Eleco-way post top lantern; the Atlas 'Alpha', 'Beta' and 'Gamma' ranges, and Holophane's glass refractor ranges including some improved designs.

Other equipment

A notable omission this year was that of related street furniture, namely bollards, signs, etc. No doubt space restriction was the reason for this but we may hope to see these old friends back next year.

Among the items of control equipment exhibited were the Venner electrically wound time-switch movements with a 9 hour spring reserve and the Sangamo-Weston spring-reserve time switches interchangeable with the synchronous movements, with synchronous control of the escapement movement. Horstmann also showed spring-reserve switches as well as their new midnight reduction time switch for switching one or two circuits of multi-lamp lanterns. The Automatic Telephone and Electric Co. featured their very versatile new traffic signal controller with variable extension.

An interesting development, shown on the Philips stand, was a new type of luminescent sign in which phosphors were embedded in vitreous enamel thus giving long life and freedom from atmospheric attack. Used in conjunction with black light these signs have a number of advantages over those normally illuminated.

Columns

Most interesting of the columns displayed were the aluminium columns shown by AEI and Atlas, the latter being a 3 per cent. magnesium alloy and with a sand blasted finish. It is beginning to look as though aluminium may at last become a serious competitor to steel and concrete for columns.

The GEC are in the column field with a good range of columns, including prestressed concrete, with shingle aggregate and artificial stone finishes and octagonal tapered steel. Adastra showed, among others, 35 ft. circular steel columns as also did Stewarts & Lloyds.

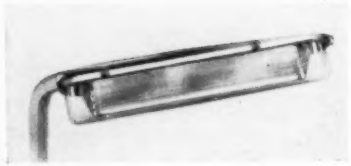
Stanton showed prestressed spun concrete columns with the excellent finish characteristics of these. Siemens showed their timber columns allied to the 'Carpenter' twin lantern and the 'Cathay' post top lantern. Revo showed steel and concrete columns in alliance with their lantern range.

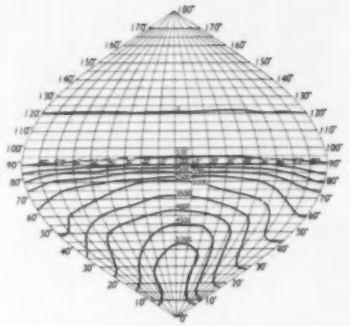
Unclassified

The EDA stand drew attention to the changing trends in street lighting with particular reference to the tendency to increased mounting height. A film taken by time lapse photography along the experimentally lighted stretch at Baillieston was continuously shown and provided, if nothing else, an intriguing glimpse into a high speed future.

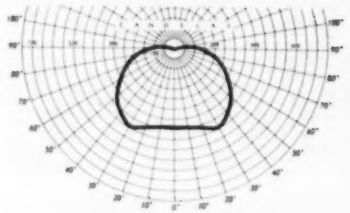
The one striking feature of this year's APLE exhibition was the emphasis on improving the standard of lighting for traffic routes. The call for this is not so much from the industry as from lighting authorities themselves, although the lighting industry is moving quickly to meet the demand. It is very refreshing for the industry to have arrived at a point where its main concern is not to persuade lighting authorities to accept a reasonable standard of lighting, but rather to keep up with the demand for more light on roads.

New Street Lighting Lanterns

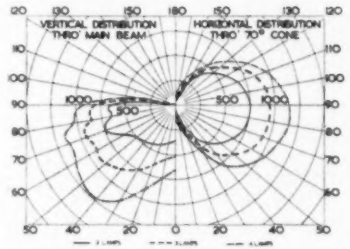
Fluorescent lamp lanterns	Lantern	Lamp	Construction	Optical System	(a) Efficiency (b) D.I.R.
	Atlas "Gamma Four" Group A	Two 250/400-watt MBF/U; or two 500-watt GLS lamps	Acrylic globe fits into threaded aluminium connection to column for post top mounting. Canopy of aluminium.	Reflector system available	—
	Atlas "Gamma Five" Group B	60/200-watt GLS lamp or 80/125-watt mercury lamp	Thick clear acrylic sheet globe attaches directly to column. Opal globe also available. Canopy of aluminium	Refractors are available	(*a*) 77% (*b*) —
	Eleco "Fluor-Ray" 30 Group B	Two, three or four 3-ft. 30-watt tubes	Die-cast aluminium alloy side entry canopy and bowl ring. One-piece "Perspex" bowl. Control gear on hinged reflector tray	"Perspex" refractor panels sealed to bowl	(*a*) 84% (*b*) 1.7 (two-lamp lantern)

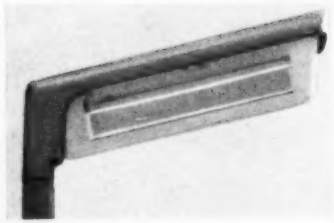
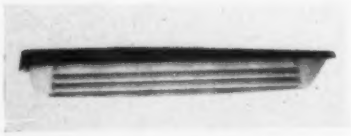


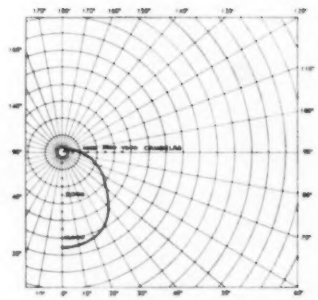
with two 400-watt MBF/U lamps.

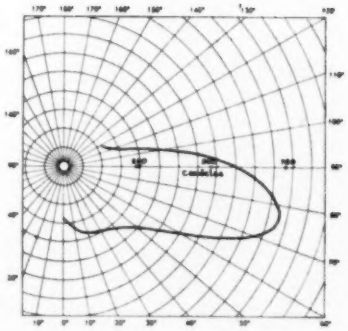


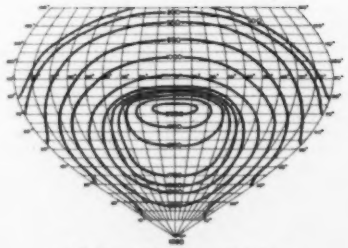
with 200-watt GLS lamp



Lantern	Lamp	Construction	Optical System	(a) Efficiency (b) D.I.R.
GEC ZD574 Group A	Three 400-watt MBF/U mercury lamps	Light alloy spinnings and die-castings. Opal "Perspex" enclosing bowl. Post-top mounting	Opal "Perspex" bowl	(*a*) 75% (*b*) —
				
GEC ZD571 Group B	Two 3-ft. 30-watt tubes	Light alloy die-castings and extrusions. Bracket mounting and lantern body are one integral unit	"Perspex" refractor plates	(*a*) — (*b*) —
				
Revo C15720 "Halcyon" Group A	Two, three or four 5-ft. 80-watt MBF/U tubes	Fibreglass canopy with "Perspex" refractor bowl. Side entry mounting. Control gear housed in lantern.	Sealed prismatic "Perspex" panels	(*a*) 75.5% (*b*) 1.06

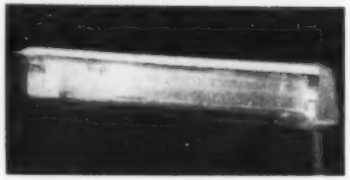




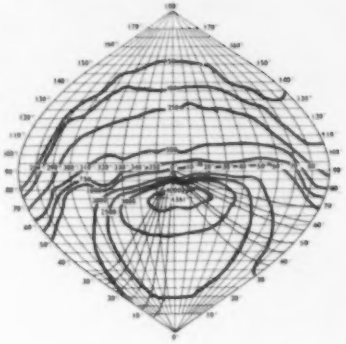


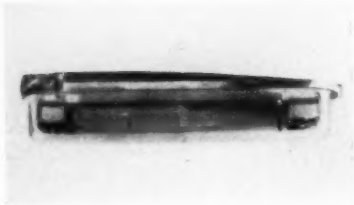
with three 5ft. 80-watt tubes.

Sodium lamp lanterns

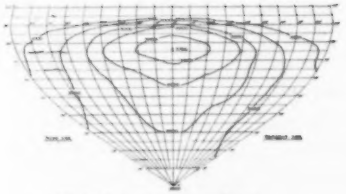


Lantern	Lamp	Construction	Optical System	(a) Efficiency (b) D.I.R.
AEI "Amberline" Group A	200-watt sodium linear lamp	Integral canopy and bowl of grey and clear "Perspex". Main casting in silicon aluminum; die-cast aluminium cover plate	"Perspex" refractor plate sealed to bowl	(*a*) 76.8% (*b*) 1.98

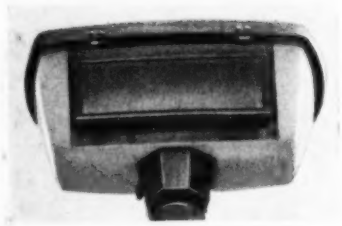




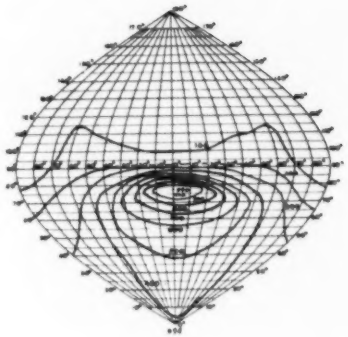
Eleco "Golden Ray 280" Group A	One 280-watt or two 140-watt or one 200-watt sodium lamp	Die-cast aluminium alloy side entry canopy and bowl ring. One-piece "Perspex" bowl	"Perspex" refractor plates sealed to bowl	(*a*) 84% (*b*) 2.2

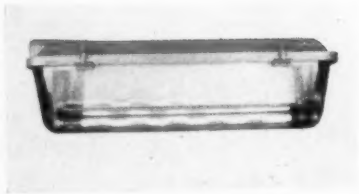
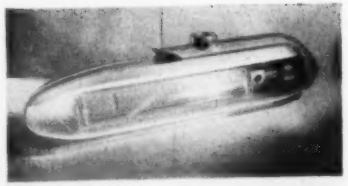


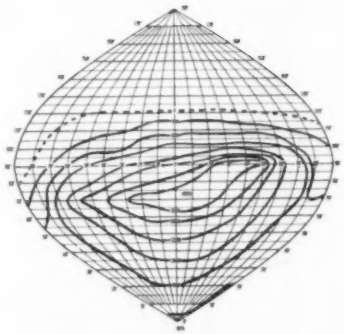
with 280-watt sodium lamp.



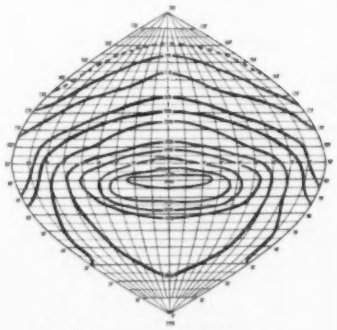
GEC ZD582 Group B	60-watt sodium	Moulded "Perspex" body and enclosing bowl. Post-top mounting	"Diakon" refractor plates	(*a*) 85% (*b*) 2.4



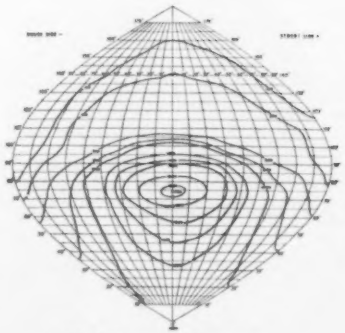
	Lantern	Lamp	Construction	Optical System	(a) Efficiency (b) D.I.R.
	Siemens Ediswan "Osprey" Group A	One or two 200-watt linear sodium lamps	Central internal cantilever bracket. Tapered pressed aluminium canopy. "Perspex" diffusers bowl. Available as single or twinhead versions	Polished aluminium reflectors	(*a*) 80% (*b*) 3.45
	Siemens Ediswan "Oline" Group A	One or two 200-watt linear sodium lamps	Aluminium alloy casting with space for control gear on tray above enamelled reflector. "Perspex" bowl	Reflector or refractor	(*a*) 75% (*b*) 2.3 (two-lamp refractor lantern)
	Wardle "Aureole" Group A or B	45/60- or 85/140-watt sodium lamps	Aluminium alloy body supporting "Perspex" enclosure which slides off for cleaning, etc.	"Perspex" refractor plates sealed to bowl	(*a*) — (*b*) —



with one 200-watt sodium lamp.

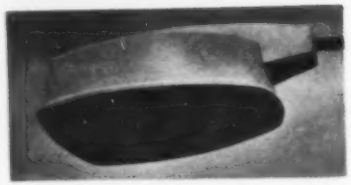


2 × 200-watt refractor lantern.

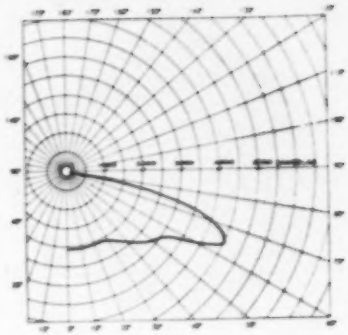


with 140-watt sodium lamp.

Mercury lamp lanterns

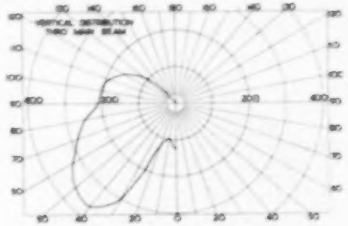


Lantern	Lamp	Construction	Optical System	(a) Efficiency (b) D.I.R.
GEC ZD596 Group A	250/400-watt MA/V or MBF/U mercury lamps	Pressed light alloy body. Hinged bottom door glazed with heat resisting clear glass	Mirror reflectors	(a) — (b) —



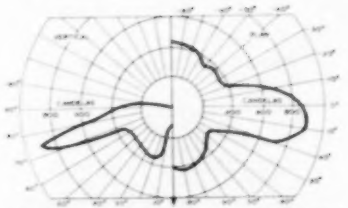
Tungsten lamp lanterns

"Eleco Way" slim post top Group B	150/200-watt GLS, 80/125-watt MBF/U or 45/60-watt sodium	Die-cast aluminium alloy base and canopy. One-piece deep drawn "Perspex" bowl	—	(a) — (b) —



with 200-watt GLS lamp.

Falks "Blenheim" Group B	100/200-watt GLS 80/125-watt MBF/U or 45/60-watt sodium	Circular conical hinged top supported by three arms. Clear or opal enclosure	Dome refractor can be used	(a) 78% (b) 2.4



with 200-watt GLS lamp and non-axial type dome refractor.

Names and addresses of firms whose lanterns are described in pages 332-336

A.E.I. Lamp and Lighting Co. Ltd., Melton Road, Leicester; Engineering and Lighting Equipment Co. Ltd., Sphere Works, St. Albans, Herts.; General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2; Revo Electric Co. Ltd., Tividale, Tipton, Staffs.; Siemens Edison Swan Ltd., 38-39 Upper Thames Street, London, E.C.4; Wardle Engineering Co. Ltd., Old Trafford, Manchester 16.

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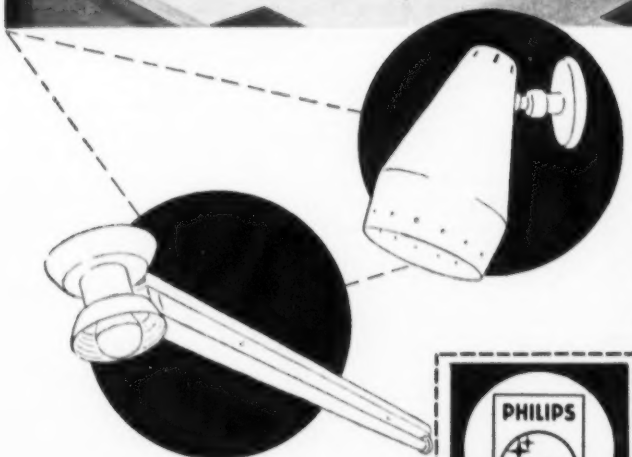

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44.1

PHILIPS FREE LIGHTING DESIGN SERVICE

A Method of Illuminating Direction Signs on Motorways

By V. J. JEHU* M.Sc., A. Inst. P.

Direction signs used on motorways must be large so that they may be easily read by a driver travelling at high speed. To maintain ease of reading at night, the signs must either be efficiently reflectorised or illuminated to a much higher standard, both as regards luminance level and uniformity of illumination, than has hitherto been thought adequate for the direction signs on general-purpose roads. This article describes a system for the floodlighting of large direction signs. The system is being tried out on some of the signs on the Preston By-pass.

The Requirements

It has been shown† that, for good legibility at night the luminance of the white parts of direction signs should be within the range 5 to 30 ft.-L. Luminances of this order should be achieved over the whole area of the sign without causing undue glare to drivers travelling in the opposite direction—who will see the reverse side of the sign and will face the lighting installation. The installation must function in all weathers and it should be easy to maintain.

The System

Basically, the floodlighting system consists of fluorescent lamps inside reflectors arranged across the width of the sign, the lamps being positioned a short distance in front of the sign and just below its lower edge. Mounting the lamps close to the sign ensures that their light output is used efficiently; it also simplifies the screening of the lamps from the view of drivers travelling in the opposite direction, the floodlights, the screening boards and the sign itself forming a compact unit. The closer the lamps are to the sign, however, the more difficult it becomes to maintain uniformity of luminance over the height of the sign. The shape of the reflector used with the fluorescent lamps has been designed to help offset the fall off in luminance in a vertical direction for a wide range of sign heights.

Figure 1 shows, for a given distance d between the plane of the sign and the fluorescent lamps, the angles at which light must be projected to reach the middle and top of the sign, for signs of various heights ranging from d to $3d$. The angle subtended at the lamps by the top and centre of the signs varies only between 16 and 19 deg. for this wide range of heights. Thus a reflector shape consisting of two parabolæ with an angle of 15 deg. between their axes will augment the light directed at the top and centre of signs of varying heights, the optimum setting of the reflector for any sign being found by rotating the reflector about its length.

In the actual profile used, the upper part of the reflector directs light towards the top of the sign and the lower part towards the centre of the sign. The transition from one parabola to the other occurs immediately behind the fluorescent tube, and this prevents any noticeable discontinuity

* Road Research Laboratory, Department of Scientific and Industrial Research.
† Smyth, J. S. "The brightness and legibility at night of road traffic signs", Trans. Illum. Engng Soc., Lond. 12 (4), 71-86 (1947).

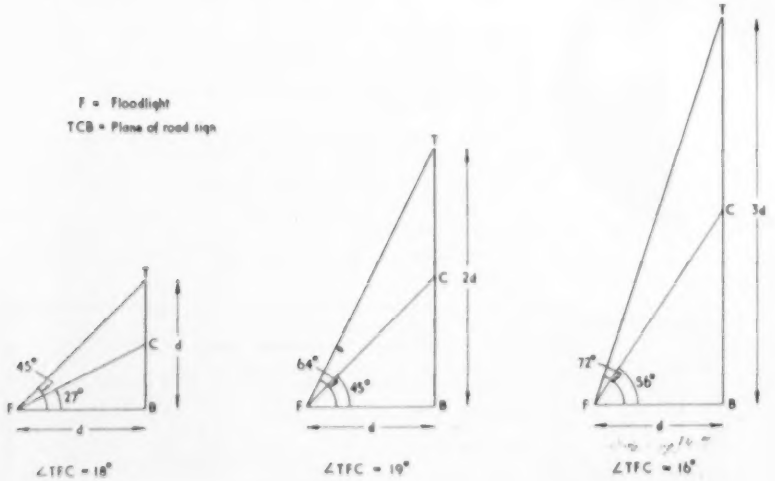

Fig.1. The angle subtended at the floodlight by the top and centre of road signs of varying heights.

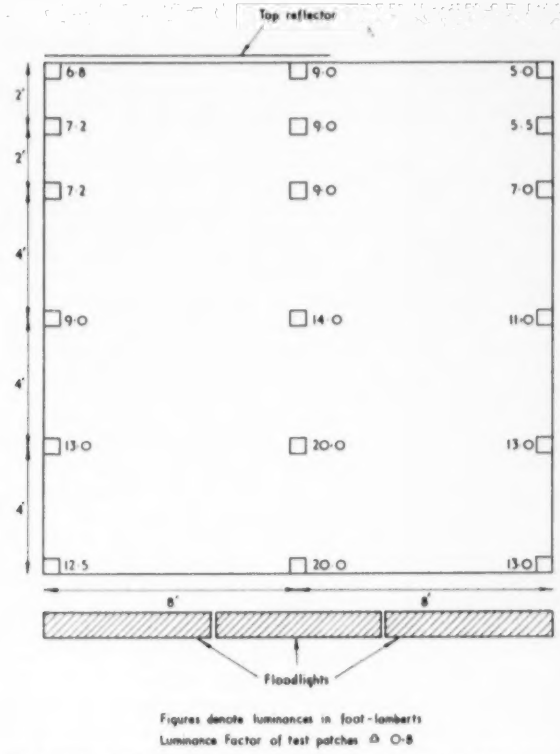

Fig.2. The luminances of white test patches on a sign 16 ft square from three floodlights 6 ft. away.

Fig.3. A tall direction sign (18 ft. 6 in. by 14 ft.) illuminated by three floodlights. The figures denote luminance values in foot-lamberts measured on the actual sign.

in illumination. To counteract the difference in the path length between the light source and the top of the sign and between the light source and the centre of the sign, the length of the profile directing light to the top of the sign has been made three times that illuminating the centre of the sign. With a focal length of 1.15 in. these considerations lead to a pronounced asymmetrical reflector with an opening of about 15 in. The focal length is short enough in relation to the diameter of the fluorescent tube (1½ in.) to ensure a considerable spread of the reflected light in the vertical plane; thus on a sign there is no noticeable transition from what may be regarded as the three separate light sources, namely the fluorescent tube providing almost all the illumination at the bottom of a sign and a progressively smaller fraction of the illumination with increasing height, the lower part of the reflector illuminating the central area of the sign, and the upper part of the reflector illuminating the top of the sign.

Luminance Measurements

Experimental reflectors to the required shape were made to accommodate 5 ft. 80-watt fluorescent tubes, the reflector surface being anodised aluminium. Experience with these units showed that a value of $d = 6$ ft. gave the best practical compromise between uniformity of luminance and a high luminance level. The measured luminances of white test patches with a luminance factor of about 80 per cent, on a sign 16 ft. square illuminated by three floodlights, showed that an overall luminance variation of 4/1 could be obtained,

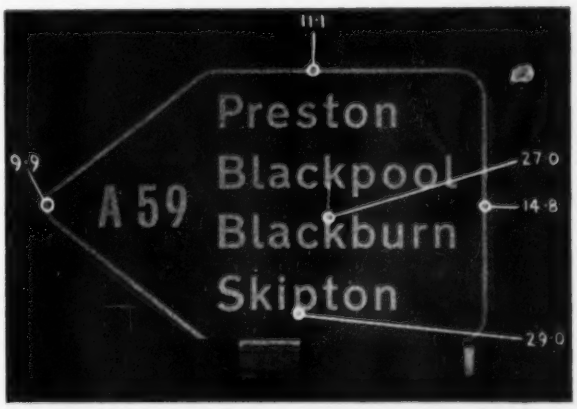

Fig.4. A short direction sign (8 ft. by 14 ft.) illuminated by two floodlights. Figures denote luminance values in foot-lamberts measured on the actual sign.

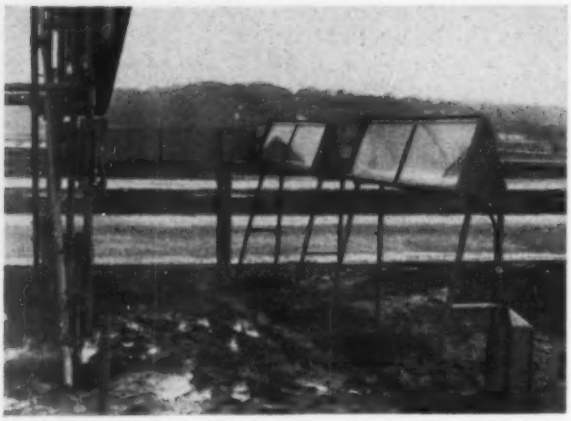

Fig.5. Floodlights and screens in relation to the bottom of the sign.

the minimum luminance being 5 ft-L, and the maximum 20 ft-L. It was also found that the top 2 ft. of the sign could be appreciably brightened by means of a flat strip of polished aluminium sheet overhanging the top edge of the sign by 9 to 12 in.; this redirected light, which would otherwise be wasted, on to the top of the sign.

Prototype floodlights were then made with reflectors and lamps enclosed with glazed fronts, and performance tests were carried out. Figure 2 shows the luminances of white test patches on the 16-ft.-square sign, with three enclosed units mounted across its base at a distance of 6 ft. A top reflector with an overhang of 9 in. was mounted over the left-hand and centre rows of test points, the right-hand row being used as a control. The results showed that, with the top reflector in position, an overall luminance variation of 3/1 can be obtained on this size of sign.

In practice, the size and shape of a motorway direction sign will depend upon the length of the message it carries and upon its method of presentation. Measurements were therefore made on the lower half only of the test sign, i.e., on an area 8 ft. high by 16 ft. wide, to determine the minimum number of floodlights and their optimum arrangement for such signs. It was found that two floodlights, stepped-in about 8 in. from the edges of the sign, were adequate, the maximum and minimum luminances being 15.5 ft-L and 7.6 ft-L respectively. The following set of rules should enable the best arrangement of floodlights to be found for a particular size of sign:—

(a) All floodlights should be mounted so that the distance from the light source to the sign is 6 ft.

(b) For signs up to 9 ft. in height, two floodlights will satisfactorily illuminate a sign up to 16 ft. wide, the outer edges of the floodlights being stepped-in about 8 in. from the sides of the sign.

(c) For signs between 9 and 12 ft. in height, the floodlights must span the full width of the sign.

(d) For signs more than 12 ft. in height, the floodlights must span the full width of the sign, and a top reflector with an overhang of 9 to 12 in. should be fitted to the top of the sign.

Snow Clearance

When the floodlights are aimed at tall signs, their glass fronts slope at an angle of about 60 deg. to the horizontal plane. In very cold weather it is possible that snow will settle on the glass and impair the performance of the floodlights.

Tests in a cold room at an ambient temperature of 23°F showed that, when the front glass of a floodlight was packed with artificial snow to a depth of about ¼ in., the heat generated by the fluorescent lamp had no noticeable effect in melting the snow. Various forms of additional heating were tried to make the floodlight capable of melting the snow. The most efficient arrangement consisted of two 350-watt coil heaters in silica tubes, connected in series and mounted along the length of the reflector near its lower edge. In this position the heaters had a negligible effect on the light output of the lamps. Special shrouded terminals were designed to enclose the metal ferrules at the ends of the heating coils, the effective power of which was 175 watts in each floodlight. The glazing frame prevented the snow from sliding off freely but the addition of a chamfered strip along the lower edge of the metal glazing frame proved most effective in enabling it to slide over the water film formed adjacent to the glass. Comparative tests in which the lower edge was chamfered over half its length showed that this half of the floodlight was cleared of snow within 45 minutes of switching on, whereas the half with the step formed by the thickness of the frame was still largely covered with snow after two hours of heating. With the strip heaters and the chamfered lower edge to the glazing frame, it is hoped that snow settling during the day will be cleared from the glass within an hour of the floodlights being switched on.

Screening Boards

It is found in practice that very little screening of the lanterns from the eyes of drivers on the opposite carriageway is necessary. Boards 15 in. in depth, arranged as shown in Fig. 5, were found to be adequate.

Preston By-pass

Floodlights made commercially to the Laboratory's design have been installed to illuminate four signs on the motorway. The largest illuminated sign is 18 ft. 6 in. high and 14 ft. wide. Figure 3 shows the floodlit sign and luminance values measured at various parts of the sign. The maximum variation in luminance of the white parts of the sign is 4.5/1. The maximum luminance variation on another sign 15 ft. 6 in. high by 14 ft. wide is 3/1. Three floodlights are used on each of these signs together with a flat reflector at the top of the signs. Figure 4 shows the taller of the other two illuminated motorway signs, approximately 8 ft. high and 14 ft. wide, and the luminances measured. The maximum luminance variation on this sign and on the fourth sign (which is similar in shape but slightly shorter) is 3/1. Only two floodlights are used on each of these signs. Figure 5 shows the arrangement of floodlights and screening boards in relation to the sign.

Acknowledgment

The work described in this article was carried out as part of the programme of the Road Research Board of the Department of Scientific and Industrial Research. The article is published by permission of the Director of Road Research.

Kai Tak Airport Hong Kong

Fig. 1. The approach from the North-West.

JUTTING 1½ miles out into the sea, Hong Kong's new airport, Kai Tak, has been designed to take the largest aircraft and to be fully operational 24 hours a day even in bad visibility. The old airport, built 35 years ago at the foot of the Kowloon Hills, could be used only from dawn to dusk and in relatively good visibility owing to limited radio and visual aids.

Owing to nearby hills which preclude a direct approach, the North-West approach lighting system includes a 3,510 ft. curved section, while the South-East approach has required lights supported on piles driven into the sea bed. The runway is 8,340 ft. long and has been built on a 795 ft. wide artificial promontory. The airport as a whole represents the largest single contract ever placed in the history of the colony and has involved the moving of over 20 million tons of soil and the paving of some 60 acres of runway and taxi-tracks, all strengthened to take aircraft of up to 400,000 lb. all-up weight.

In addition to the lighting, the airport is being equipped with the most modern ground-to-air aids, including long-range surveillance radar, short-range precision approach radar and instrument landing equipment.

The operational requirements for the airport were developed by the Hong Kong Department of Civil Aviation which began planning as early as 1953-54 in conjunction with the Ministry of Transport and Civil Aviation. The lighting scheme was decided upon in liaison with the consulting engineers for the overall project, Scott, Wilson, Kirkpatrick and Partners, and Preece, Cardew and Rider, the latter preparing the detailed electrical design and drawing up the contract for this work. The contract was awarded to The General Electric Co. Ltd. of England, who supplied all the equipment which was installed by its associate, The British General Electric Co. Ltd. of Hong Kong.

North-West Approach

Aircraft approaching from the West start their let-down procedure over the West Lamma Channel between Cheung Chau and Stonecutters Islands (see Fig. 2). They then turn when over Sham Shui Po and again over Kowloon City, the Lion Rock Hills precluding a direct approach.

To help pilots align themselves on the correct approach flight path, a location beacon giving green flashing signals has been erected on a hill near the Tai Hang Tung resettlement area. The beacon is about 4,000 ft. from the beginning of the North-West approach lighting system. This system (see Fig. 3) consists of a 3,510 ft. line curving on an arc of a circle designed to conform to a rate one turn* of an aircraft flying at 140 knots. The approach is then straight (and in line with the runway centre-line) for the remaining 2,800 ft. to the threshold bar. Lights are spaced 538 ft. apart on the curved section of the approach centre-line and 200 ft. apart on the final 3,000 ft. (from crossbar No. 3 to the threshold).

Crossbars of lights installed at the start (No. 4) and finish (No. 3) of the curved approach and at 2,000 ft. (No. 2) and 1,000 ft. (No. 1) from the threshold help the pilot to judge the horizontal attitude of his aircraft and, since

Fig. 2. Typical approach path.

* A rate one turn entails changing course at the rate of 3° per second; e.g., an aircraft would complete a circle in 2 minutes.

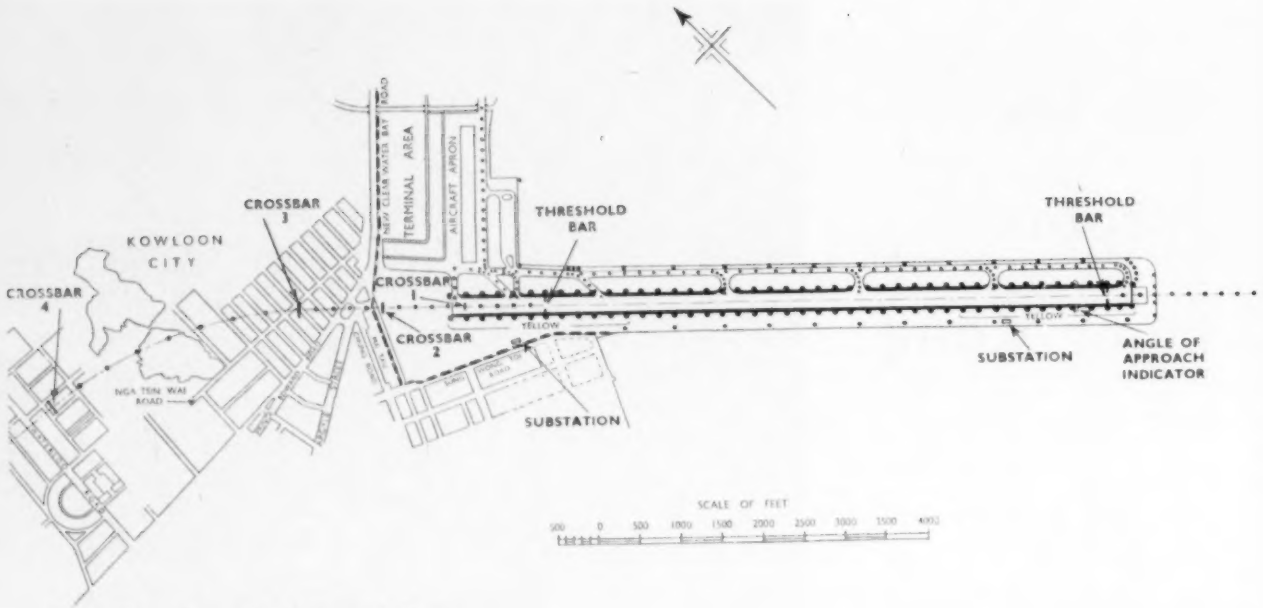

Fig. 3. Plan of approach and runway lighting.

the final three bars decrease in width towards the runway, also give a rough indication of height.

On the curved section of the approach, together with crossbars Nos. 2 and 3, the high-intensity lights—which have a limited horizontal beam spread—have had to be duplicated and angled so that they present a complete lighting pattern to a pilot passing over the location beacon. Thus, on the initial approach (from the location beacon to crossbar No. 4) the pilot sees a complete lighting pattern from one set of lights, and then along the curve he sees it from the second set; to assist in the transition from one set of lights to the other (with no intervening period of darkness) the beams have been arranged to overlap.

Since the end of the runway is so close to Kowloon City, the approach clearances are necessarily high and many of the approach lights have had to be mounted on the roofs of buildings or on structures specially erected for the purpose. Getting the lights exactly where they are wanted in a densely populated and congested area of Hong Kong was quite a problem and resulted in some complex engineering structures. (The supply to this system involved some seven miles of cable, for which the trenches were dug through the streets of the city and over the Kowloon foothills, and refilled when the cables had been laid, in the record time of five days. At one part, up precipitous foothills, the cable had to be supported by an overhead catenary for a distance of about 200 ft.)

Each of the high-intensity and low-intensity patterns is connected on individual duplicate series circuits fed from separate supply sources on the airport. The duplicate circuits are "interleaved"—that is, each circuit feeds alternate lights, so that if one supply source should fail, the approach pattern is maintained but with alternate lights only (i.e., double spacing).

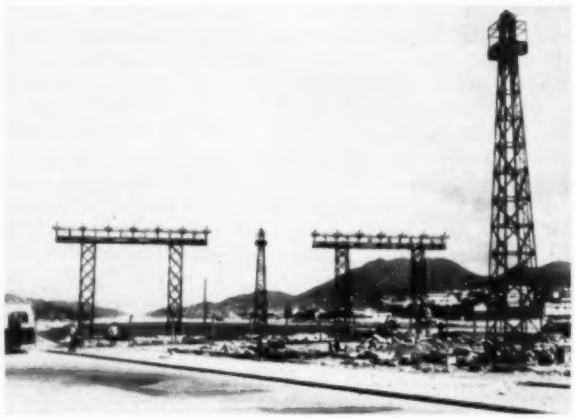

Fig. 4. Cross-bar No. 2 and centre-line lights—North-West approach.

Fig. 5. High and low intensity lights on cross-bar No. 3 showing how they have had to be sited amongst the buildings of the city.

Runway Lighting

The runway is equipped with a dual system of high and low intensity lights spaced 200 ft. apart. Each system is supplied by two separate series ring circuits, each fed from a different substation so that, as with the approach lighting,

Fig. 6. Close-up of fittings in cross-bar No. 4.

Fig. 7. South-East approach lights on piles in the sea.

failure of one circuit cuts out only alternate lights. The lights are of the elevated type—except at taxi-track intersections, where inset fittings have been installed—and are on frangible mountings so that little damage is caused to an aircraft if it collides with them.

The runway lighting is white, except for the last 2,000 ft. facing the approach where yellow filter screens have been fitted. This colouring gives the pilot an indication of range when taking off or landing: white for three-quarters of the runway and yellow for the remainder.

For landing, each end of the runway is marked by a threshold bar of green inset lights. Extending on either side of these bars—as an additional aid in bad visibility—are wing-bars of elevated high-intensity white lights. Threshold and wing-bar lights are supplied and controlled from the airfield substations.

Inset fittings have been used for the threshold bars because, due to the high approach clearance over Kowloon City and the harbour, the bars have had to be located further down the runway than is usual and in stretches which may be used for take-off.

Each end of the runway is marked by a line of inset high-intensity red lights, but these are screened so that they can only be seen on take-off.

Running parallel with the runway for the whole of its length is a 75 ft. wide taxi-track with eight connecting tracks. All these taxi-track sections have been equipped with inset green taxi-way lights, spaced 160 ft. along the centre-lines except at curves where the spacing has been reduced to improve definition. These lights are supplied on separate series circuits, as with the runway lights, and there are 24 taxi-track circuits in all.

South-East Approach

Aircraft approaching from the East enter the harbour through the Lei Mun Gap on a direct bearing with the runway. The approach lighting for this runway consists of a 2,000 ft. centre-line of high- and low-intensity lights spaced 200 ft. apart and mounted on piles driven into the sea bed. Both the high- and low-intensity systems are connected on individual series circuits fed through submarine cable from separate supplies.

In poor visibility pilots approaching from the South-East are also assisted by two high-intensity angle of approach indicators, one on either side of the runway and about 1,000 ft. down the runway from the threshold bar. These indicators give a flashing beam of light, divided horizontally into three coloured zones. If the pilot is too low he sees a red light, if he is too high it will be amber, while green indicates that he is on the correct glide path.

Other lighting

Both the North-West and South-East approach systems are equipped with high-intensity lights to form lead-out patterns for take-off. Circuiting for these lights is similar to that provided in the approach lighting. Since the low-intensity approach lights are omni-directional, they can be used as both approach and lead-out lights.

The outer edge of the promontory extending into Kowloon Bay is marked by red low-intensity elevated lights suitably spaced to give definite indication of the land limits, while the extreme end of the promontory is also marked with lights for warning shipping.

The whole of the apron is illuminated by floodlights mounted on 45 ft. high towers spaced along the North-West edge. These lights are designed to give wide horizontal and narrow vertical beam spreads, and can be adjusted to provide adequate coverage of the loading areas without dazzling pilots when taxi-ing.

All the high-intensity lighting in the approach, lead-out and runway systems, threshold bars and angle of approach indicators can be controlled separately in five steps of brightness—100, 30, 10, 3 and 1 per cent of maximum.

Electrical Supply

The main electrical supply to the airport is from the China Light and Power Company's network at 6,600 volts, 3 phase, 50 cycles through transformers which reduce the voltage to a 346/200-volt, 3 phase, 4 wire supply. This latter voltage is controlled by a low-tension distribution switchboard which, in turn, supplies the two main airfield lighting substations, one at each end of the runway; the substation at the South-East end is below ground level.

Each substation houses a low-tension switchboard containing the contactor panels required for the airfield lighting circuits. To guard against mains failure or a fault in an auxiliary feeder, each substation is provided with a diesel standby generator arranged to start up automatically on either complete or partial failure of the incoming supply; the generators also shut down automatically when the supply is restored.

Control

All the airfield lighting, including the location beacon on the North-West approach, is remotely controlled from a console in the control tower. The console is equipped with switches for runway direction, lighting brightness con-

trol and circuit selection and has a mimic diagram of the whole installation. Miniature lamps in the mimic diagram represent actual circuits on the airport and the appropriate lamps light up when a particular circuit has been selected. Both visual and audible warning devices have been incorporated to indicate failure in any circuit.

As the substations containing the diesel standby generators and the switchgear controlling the incoming supply are normally unattended, the state of these units is monitored back to the control tower where a 24-hour watch is maintained. Thus, the state of the electrical supplies for the whole airport is indicated on the control desk by mimic lamps.

The provision of the airfield lighting system and its electrification has required 675 lighting fittings of various types, 120 core miles of power cable, 100 core miles of control cable, and the making of more than 3,000 cable joints.

Forthcoming Events

LONDON

December 8th

Lighting of Drawing Offices by J. B. Collins and F. G. Langdon. At the Federation of British Industries, Tothill Street, S.W.1, at 6 p.m.

CENTRES AND GROUPS

December 1st

HULL.—Fifty Years of Lighting Development, by J. W. Powell. At the Lecture Theatre, Yorkshire Electricity Board, Ferensway, Hull, at 6.30 p.m.

STOKE-ON-TRENT.—Visit to Lighting Installation.

December 2nd

EDINBURGH.—New Data for Calculation of Coefficients of Utilisation, by W. Robinson. At the YMCA Social Room, 14, South St. Andrew Street, Edinburgh, at 6.15 p.m.

NEWCASTLE-UPON-TYNE.—Symposium of Present Day Commercial Lighting. In Room B7, Kings College, Queen Victoria Road, Newcastle, at 6.15 p.m.

December 3rd

SOUTH AFRICA.—Control Gear Circuits, by J. Salmond.

CARDIFF.—Chairman's Address, by A. J. Dalton.

GLASGOW.—New Data for the Calculation of Coefficients of Utilisation, by W. Robinson. At the British Lighting Council, 29, St. Vincent Place, Glasgow, at 6.30 p.m.

NOTTINGHAM.—Forum.

December 7th

LEEDS.—The Next Fifty Years of Lighting Development, by R. T. O. Freeth. Joint Meeting with The Publicity Club of Leeds. At the British Lighting Council, 24, Aire Street, Leeds 1, at 6.15 p.m.

December 10th

MANCHESTER.—Road Surface Illuminants in the Practice of Public Lighting, by J. B. de Boer. At the Demonstration Theatre, Town Hall Extension, Manchester, at 6 p.m.

SWANSEA.—Lighting and Architecture, by J. M. Waldram. Joint meeting with IEE. At the Demonstration Theatre, The South Wales Electricity Board, The Kingsway, Swansea, at 6.30 p.m.

December 14th

BIRMINGHAM.—Amateur Photography, by R. W. Unwin. At the MEB Lecture Theatre, Darlington Street, Wolverhampton.

SHEFFIELD.—Technical Film Show. At the Grand Hotel, Sheffield, at 6.30 p.m.

December 15th

LIVERPOOL.—New Development in the Calculation of Coefficients of Utilisation, by W. Robinson. At the Merseyside and N. Wales Electricity Board Industrial Development Centre, at 6 p.m.

Situations

Wanted

LIGHTING DESIGNER/ENGINEER (32), C and G Final Certificate, seeks progressive, responsible position in London or Southern England. Wide experience of commercial and decorative fittings and schemes. Apply Box 611.

Vacant

REPRESENTATIVE for London area required by manufacturers of decorative lighting fittings. Salary, commission, expenses. Should own car. Write Knightshades Limited, St. Leonards-on-Sea.

LIGHTING SALES ENGINEER required by large Electrical Manufacturing Company in London. Capable of preparing interior and exterior lighting schemes. IES/APLE Member preferred. Age 25/35. Salary dependent on age, qualifications and experience up to £1,000 per annum. 5-day week, pension and bonus schemes. Apply giving details of experience to Box 610.

ALLOM HEFFER, of Knightsbridge, makers of lighting fittings for commercial and industrial uses, require a SALES REPRESENTATIVE for London to call on Architects, Consulting Engineers and big commercial companies. Excellent prospects in this expanding business for a man of forceful personality and drive. Apply in writing to 17, Montpelier Street, London, S.W.7.

DRAUGHTSMAN required for interesting work in Lighting Fittings Design Office. Write stating age, salary required and full details of experience, etc., to Box 608.

ALLOM HEFFER, Lighting Fittings Manufacturers, Knightsbridge, require draughtsman as assistant to their Director of Design, experience of lighting fittings essential and must be capable of developing full size drawings from preliminary sketches. Apply in writing to 17, Montpelier Street, London, S.W.7.

LIGHTING ENGINEER required for survey and design work on industrial lighting schemes. Age 25/35. Should have had previous experience in these fields. Preference will be given to applicants who have formerly worked for manufacturers or electrical contractors. The work is interesting and should appeal to men of initiative. Salary will be commensurate with applicant's qualifications. Pension and life insurance scheme in operation. Apply in writing, to Personnel Manager, Simplex Electric Co. Ltd., Blythe Bridge, Stoke-on-Trent, N. Staffs.

LIGHTING REPRESENTATIVES. Representatives with experience in lighting are required by manufacturers of a modern lighting system to call upon architects and users in London and the Home Counties. A salary of £900 per annum is envisaged plus commission, expenses and a car. The position is superannuated and with good prospects for advancement. Please submit in confidence details of education and career to Sales Director, Box 612.

LIGHTING ENGINEERS in the 25/35 age group required. There are opportunities both for development in the London Drawing Office and outside activities. Own staff notified. Please write stating qualifications and salary expected to Chief Lighting Engineer, Box 613.

LIGHTING ENGINEER required to assist in the planning of specialised lighting schemes. A good salary will be paid commensurate with experience and ability. Applications giving full details to the Senior Lighting Engineer, Box 614.

See also page xxv.

Trade Literature

A.E.I. LAMP AND LIGHTING CO. LTD., Melton Road, Leicester.—A new leaflet, "Lighting for Industrial Roads," illustrating lamps and street lighting columns for industrial use.

EKCO-ENSIGN ELECTRIC LTD., 45, Essex Street, London, W.C.2.—Several leaflets illustrating the company's range of Fluorescent Batten Fittings, Fluorescent Control Gear and Accessories, Lamps and Tubes and Industrial and Decorative Fluorescent Fittings.

MAJOR EQUIPMENT CO. LTD., Gorst Road, London, N.W.10. —A new catalogue illustrating the "Multi" range of Fluorescent and Tungsten fittings.

VICTOR PRODUCTS (WALLSEND) LTD., Box No. 10, Wallsend-on-Tyne.—Leaflet No. L.300 gives details and prices of the Miniature Fluorescent lighting fittings.

Personal

MR. O. W. J. FARMER has been appointed Group Publicity Manager with collective responsibility for publicising the products of the AEI Divisions and subsidiary companies managed by the British Thomson-Houston Co. Ltd. These include Heavy Plant, Motor and Control Gear and Electronic Apparatus Divisions, Birlec Ltd., and AEI Lamp and Lighting Company. Mr. Farmer joined AEI immediately after the war as Assistant Manager of the Lamp and Lighting Publicity Department (BTH) and was appointed Manager of that department (now AEI Lamp and Lighting Publicity Department) in 1952. His office will be at Crown House, Aldwych, London, W.C.2. Mr. Farmer has been succeeded at the AEI Lamp and Lighting Co. by MR. R. E. HOPKIN.

Recent appointments to the staff of AEI Lamp and Lighting Co. Ltd. include the following:—

MR. H. G. LILLEY has been appointed Sales Manager. Mr. Lilley joined the BTH Co. Ltd. in 1935 and opened the BTH Cambridge Depot in 1936. He was appointed Assistant Regional Manager (Lighting) of the Midland Region of AEI in 1955 and Manager of the Lighting Sales Department in January 1958.

MR. W. C. HUSTON has been appointed Marketing Manager. He was Manager of the BTH Lighting Department from 1940 to 1949 when he became Manager of the Lamp Sales Department. He took over the management of the AEI Lamp Sales Department in 1955.

MR. T. A. F. GOOCH, who has been the Preston Area Manager since 1955, becomes Assistant Sales Manager. He joined the Metropolitan-Vickers Electrical Co. Ltd. in 1940 and was appointed Assistant Lighting Engineer at the Birmingham office. He held this post for three years until he was transferred to the Manchester office as Senior Lighting Engineer.

MR. G. O. SPARKS, Dip.MIES, has been appointed Export Manager of the combined Lamp and Lighting Department. Mr. Sparks joined Metropolitan-Vickers Electrical Co. Ltd. in 1935 and subsequently the Curtis Lighting Co. and Benjamin Electric Ltd. In 1948 he re-joined Metropolitan-Vickers and on the formation of AEI Lamp and Lighting Co. Ltd., he was appointed to the Lighting Sales Department Headquarters becoming Assistant Manager of the Commercial Sales (Lighting) Department in December 1958.

MR. E. F. LYNN, formerly Manchester Regional Lighting Engineer, has been appointed Manchester Area Sales Superintendent and MR. S. SMITH has been appointed Cheltenham Area Sales Superintendent.

MR. ALFRED WILCOCK, AMIEE, Dip.MIES, has been appointed Assistant Director of the British Lighting Council as from November 1st, 1959. A native of Leeds, Mr. Wilcock, who is 36, joined the ELMA Lighting Service Bureau in 1951 as Regional Engineer for the North West of England and North Wales, and has held this same position with the British Lighting Council since its formation. He was Honorary Assistant Secretary of the Manchester Centre of the IES from 1952 until this year when he became Chairman of its Jubilee Committee, and since 1952 he has also been Honorary Secretary of the Merseyside Electric Lighting Services Committee, of which he has been a member since 1951. For two years he was a part-time tutor in Illuminating Engineering at Leeds College of Technology, for four years at Manchester College of Technology, and is just completing his second year in a similar position at the College of Advanced Technology in Salford.

Philips Electrical Ltd. announce the appointment of MR. A. M. GUMMER as Manager of the Special Lamps Department. He joined Philips Electrical Ltd. in 1950 and became Area Lighting Manager, South-East Region, in 1957.

Obituary

Frederick Lumley Cator

Frederick Lumley Cator who was born in Bulawayo in July, 1908, died at his home in Johannesburg, South Africa, on August 19th, 1959, after a serious illness. He received his early education at Plumtree School, Southern Rhodesia, and at Malvern College in England. His practical training was obtained with the BTH Company at Rugby, and he obtained his B.Sc. (Eng.) degree at King's College, London University, in 1932. In 1935 he was in charge of the Lighting Department for the BTH Birmingham Office and Depots and in 1946 became Chief Lighting Engineer for E. K. Cole Ltd., Southend-on-Sea. In 1948 he re-joined BTH and went to South Africa as a member of the staff of BTH (SA) Pty. Ltd., remaining with them until 1954 when he joined Hubert Davies & Co. Ltd., Johannesburg, as Chief Lighting Engineer, which appointment he held until his death.

He was a Foundation Member of the South African National Committee on Illumination and was a past vice-chairman. He was also one of the enthusiasts who created the South Africa Centre of the IES of which he was the first chairman. Recently he acted as chairman of the South African IES Golden Jubilee Sub-Committee and organised the excellent Exhibition "Lighting Through the Ages" which proved to be a great success. He was also actively associated with the South African Sales Managers' Association.

Freddy Cator had many friends in the lighting industry particularly in South Africa and in the UK. His last visit to England was in 1958 when with Mrs. Cator he attended the IES Summer Meeting at Eastbourne. We extend our deepest sympathy to his widow.

POSTSCRIPT By 'Lumeritas'

THE verbal battle over the choice of lamp-posts continues to be waged in a rather sporadic succession of engagements. One of these has just been fought in my own home town, and with the futility that has characterised so many others. The annual exhibition of these pieces of street furniture, which is arranged by the APLE, usually excites a burst of activity on the part of the opposing 'armies' (why should it always be schools?) of thought, and so it has been this autumn. But, apart from letters to the editors of various publications, the *Daily Telegraph* published in late September quite a good—and amusingly illustrated—article on this topic by John Betjeman. A month later the same national 'daily' published illustrations of the winning designs in a national competition for lamp-post designs which was organised by the Aluminium Development Association. I must say that the winning design for a 25 ft. column for trunk roads seems to me to have no particular aesthetic merit. Already there are more graceful and attractively proportioned columns available. At least one such will be found illustrated in the advertisement pages of *Light and Lighting* for last month, and another model shown in these pages bears a very close resemblance to the winning design I have mentioned. Neither of them is so light in weight as the winning aluminium post but appearance was one of the judges' principal criteria. There is generally a best in any collection of designs but, of course, it does not follow that the best in this latest collection is better than the best of the currently available columns.

LISTENING recently to the breakfast-time magazine broadcast by the BBC after the early morning news bulletin, I was interested to hear reference made to the static character of conventional artificial lighting and the recent introduction by one manufacturer of a luminaire designed to relieve lighting monotony. I mentioned this matter of the boring (stillness) of artificial lighting last month and have referred to it more than once during the past few years. The desirability of making artificial lighting continuously variable while being also continuously adequate was first postulated by Weston seven years ago in a paper on visual fatigue which was presented to the IES in London and, subsequently, to the IES in New York. I remember seeing at an Earls' Court exhibition earlier this year a tungsten lighting unit produced by another British manufacturer for the purpose of continuously varying the distribution of environmental brightness within certain limits. Weston's belief that the constancy of 'good' modern interior artificial lighting is an over-rated virtue, and that the important objective now is to "bring artificial lighting to life" so as to make it more acceptable wherever it has to be lived with for lengthy periods, seemed heretical to some lighting people and challenging to others when it was originally expressed. Bringing artificial lighting to life means animating it, and it seems that the development and practice of this "alive" lighting is at length beginning.

ANOTHER aspect of lighting and living formed the subject of the fascinating fifth Trotter-Paterson Memorial Lecture given last February by Professor Sir Solly Zuckerman, CB, FRS. The transcript of this lecture is included in the Transactions of the IES published last month, and anyone who has a copy and fails to read it will miss something of absorbing interest. Fortunately, I was able to listen to the lecturer himself, but I have looked forward eagerly to having the printed words which will renew the enjoyment and instruction I got from Sir Solly's spoken words. It is only very recently that Sir Solly's appointment as scientific adviser to the Ministry of Defence was announced. He will take up his new post in the New Year. At present he is Professor of Anatomy at Birmingham University and also Hon. Secretary of the Zoological Society. He is a man of many parts and it is refreshing to find a biologist chosen for the appointment he is about to take up.

ACCORDING to the Scientific Correspondent of the *Financial Times* (in which I follow the fortunes of lighting and other companies), a new form of glass has been developed in East Germany. It is a glass which turns milky or opalescent when exposed to strong sunlight and regains its original transparency when the sunlight weakens. The normal transparency is said to be equal to that of ordinary glass and the reaction of the new glass to sunlight is controllable within certain limits. I do not know for what special applications this novel glass was developed but it is expected to have certain uses in building construction. Will the makers of sunblinds be going out of business eventually?

SOME recent self-inflicted doses of TV advertisers' announcements have brought home to me the vital role of synthetic cleansing agents in brightness "engineering." It is high time that courses of instruction for would-be lighting engineers were brought up to date by including in the syllabi lectures, demonstrations and practical work on the production of "shining, shining whiteness and brightness" by the latest 'sources', which are conveniently packaged in desiccated form. As for bringing ordinary glass-enclosed brighteners to the notice of the vast viewing public, although I found that some use is being made of ITV for this purpose, it pales into insignificance by comparison with the efforts of other product mongers. When will the lighting industry get wise to the opportunities that are being missed? Isn't it time that televiewers were indoctrinated with such truths as

Bright-Ray lamps light lightest and brightest of all, and
You will look a little lovelier each day
In light from fabulous pink Bright-Ray?

The first of these should be accompanied by a display of the studio lights which the cameras usually ignore, and the second should be sung to a melodious orchestral accompaniment. If these suggestions savour too much of plagiarism the second one might be modified thus—

You will look a little better each way
When all lit-up with Dazzy Lamps' Bright-Ray.

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Lighting louvre moulded in Lustrex UVL by E. Elliott Ltd. for Harrison & Sheldon Ltd.

Lustrex UVL is a high-quality polystyrene that resists discolouration on exposure to ultra-violet light. It is easily cleaned and does not corrode.

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By J. A. Lynes, B.Sc. (Eng.), Dip. M.I.E.S.

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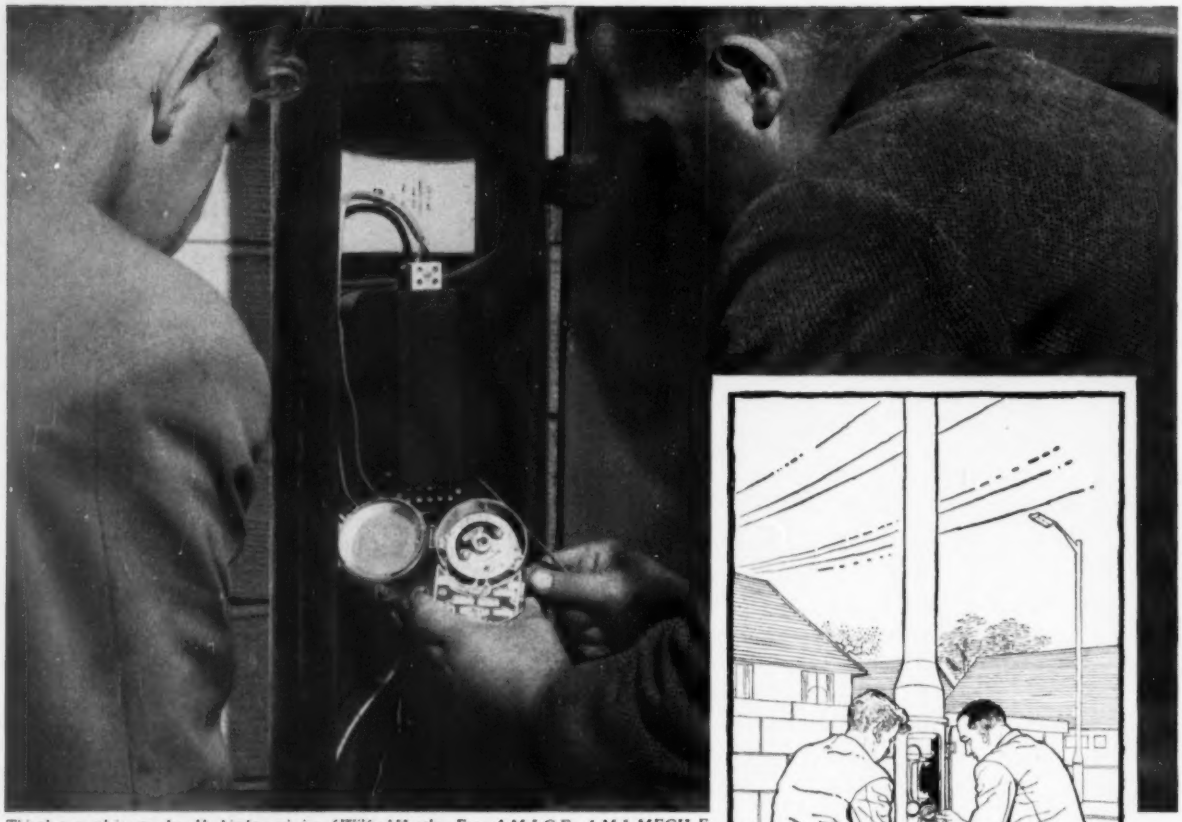

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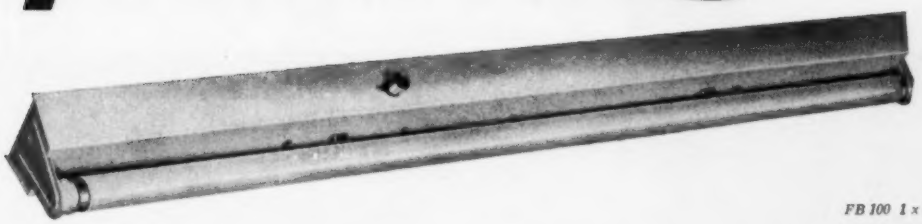

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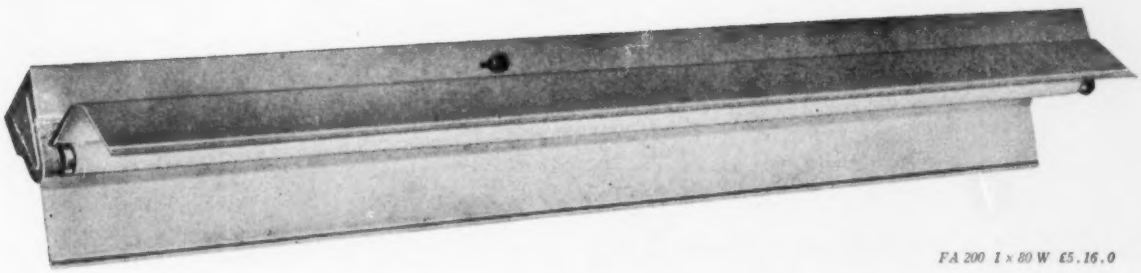

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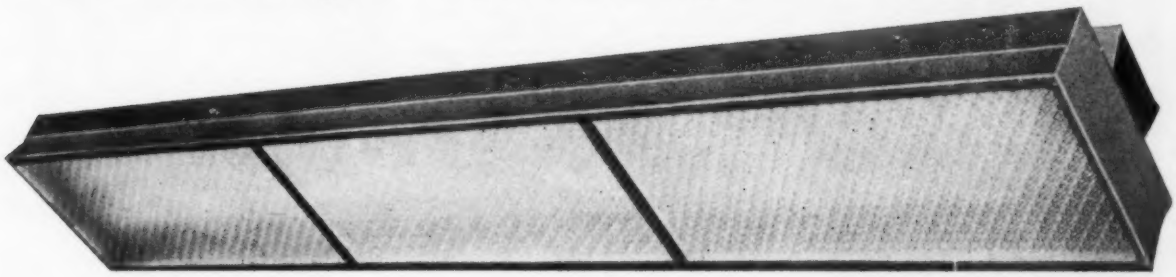

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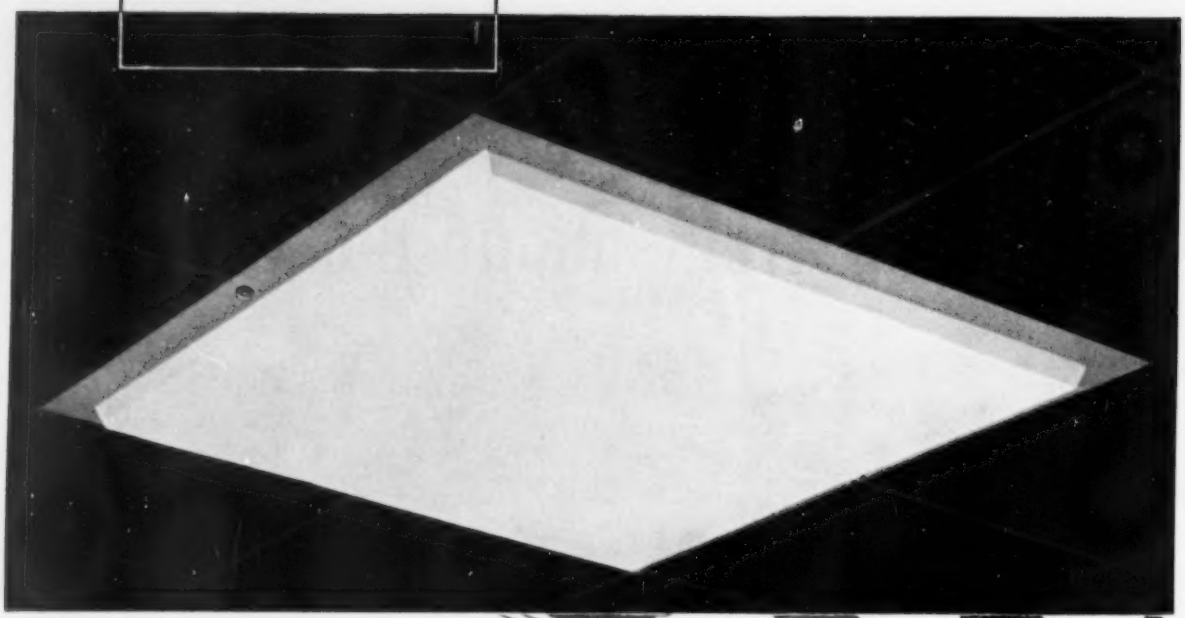

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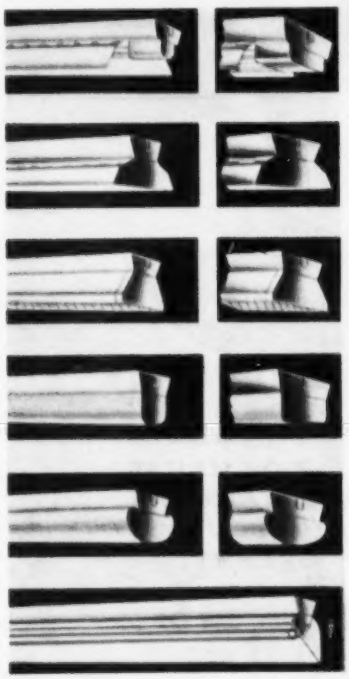

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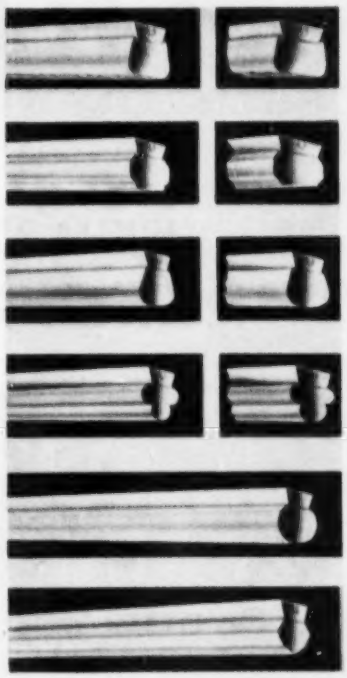

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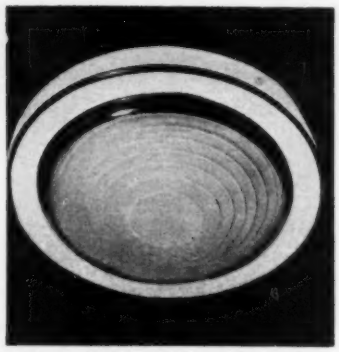

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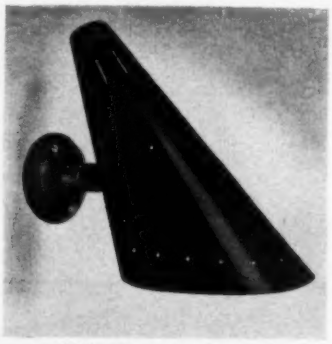

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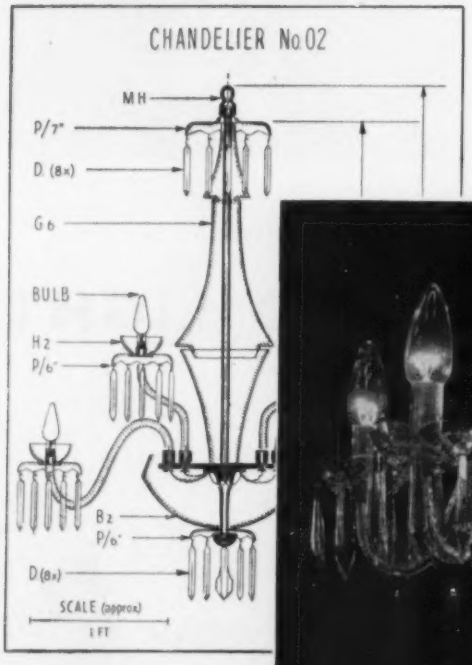

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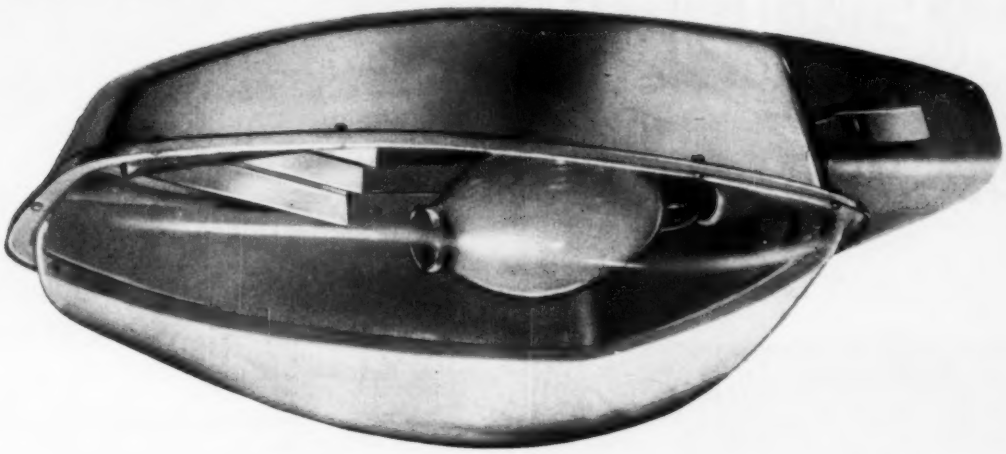

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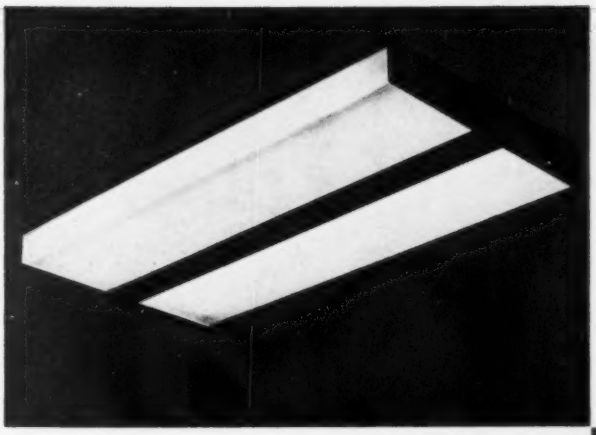

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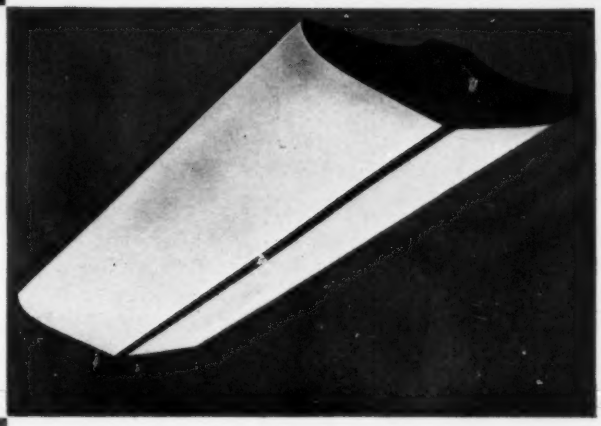

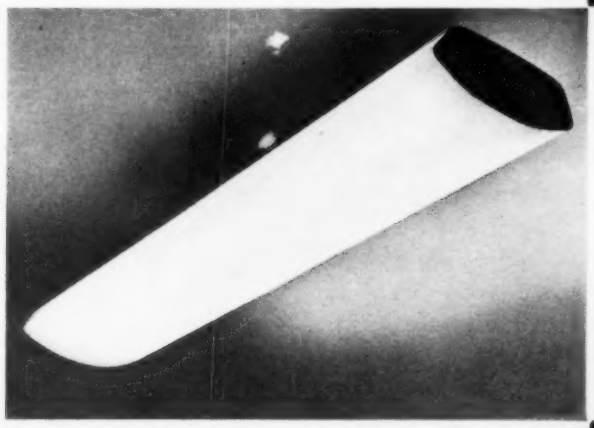

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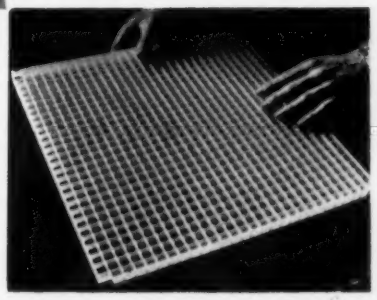

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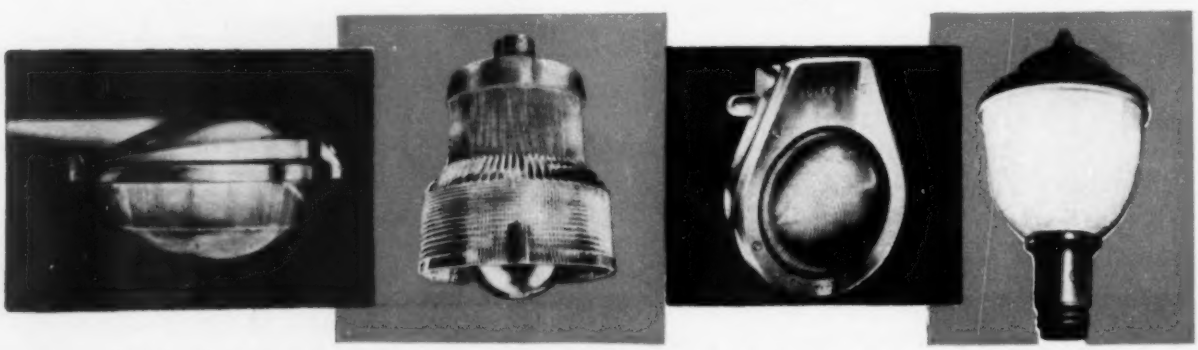

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